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ABSTRACT

The rate training manual is designed to help meet the occupational qualifications for advancement to Signalman First Class (SMI) and Chief Signalman (SMC). Chapter one discusses advancement, its rewards, responsibilities, and requirements. In chapter two administrative and training duties are explained with special emphasis on the coverage of the files and logs maintained by communication departments. Chapters three through eleven consist of illustrated material on naval communications, convoy communications, security, equipage and material management, assisting OOD (Officer of the Day), pilot-electronic navigation, special signals, operations/communication department, and assistant to the signal officer. A subject index is appended. (Author/BP)

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SIGNALMAN 1 & C

NAVAL EDUCATION AND TRAINING COMMAND

RATE TRAINING MANUAL NAVEDTRA 10136-C

PREFACE

This book is written for Signalmen of the United States Navy and Naval Reserve who are studying for advancement in rating to SM1 or SMC. Study of this text should be combined with practical experience, reviewing other applicable Navy Training Courses and studying pertinent communication doctrinal and procedural publications.

This Navy Training Course was prepared for the Chief of Naval Education and Training by the Naval Training Publications Detachment, Washington Navy Yard, Washington, D.C. 20374. It was reviewed by the Office of the Chief of Naval Operations and by personnel of the Signalman Schools, Fleet Training Centers, San Diego, California and Newport, Rhode Island.

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THE UNITED STATES NAVY

GUARDIAN OF OUR COUNTRY

The United States Navy is responsible for maintaining control of the sea and is a ready force on watch at home and overseas, capable of strong action to preserve the peace or of instant offensive action to win in war.

It is upon the maintenance of this control that our country's glorious future depends; the United States Navy exists to make it so.

WE SERVE WITH HONOR

Tradition, valor, and victory are the Navy's heritage from the past. To these may be added dedication, discipline, and vigilance as the watchwords of the present and the future.

At home or on distant stations we serve with pride, confident in the respect of our country, our shipmates, and our families.

Our responsibilities sober us; our adversities strengthen us.

Service to God and Country is our special privilege. We serve with honor.

THE FUTURE OF THE NAVY

The Navy will always employ new weapons, new techniques, and greater power to protect and defend the United States on the sea, under the sea, and in the air.

Now and in the future, control of the sea gives the United States her greatest advantage for the maintenance of peace and for victory in war.

Mobility, surprise, dispersal, and offensive power are the keynotes of the new Navy. The roots of the Navy lie in a strong belief in the future, in continued dedication to our tasks, and in reflection on our heritage from the past.

Never have our opportunities and our responsibilities been greater.

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CHAPTER 1

ADVANCEMENT

This rate training manual is designed to help you meet the occupational qualifications for advancement to Signalman First Class and Chief Signalman.

Whether you are in the Regular Navy or Naval Reserve, this text must be completed satisfactorily before you can advance to SM1 or SMC. It is recommended that you study this opening chapter carefully before beginning intensive study of the remainder of this course.

REWARDS AND RESPONSIBILITIES

Advancement in rating brings you increased rewards as well as increased responsibilities. The time to start looking ahead and considering the rewards and responsibilities of advancement is right now, while you are preparing for advancement to SM1 or SMC.

By this time, you are well aware of many of the advantages of advancement in rating: higher pay, greater prestige, more interesting and challenging work, and the satisfaction of getting ahead in your chosen career. Also, you probably have discovered that one of the most enduring rewards of advancement is the personal satisfaction you find in developing your skills and increasing your knowledge.

The Navy also benefits by your advancement. Highly trained personnel are essential to the functioning of the Navy. Each advancement in rating enhances your value to the Navy in two ways. First, you become more valuable as a technical specialist in your own rating. Second, you become more valuable as a man who can supervise, lead, and train others and thus make far-reaching and long-lasting contributions to the Navy.

The extent of your contribution to the Navy depends, in large measure, upon your willingness and ability to accept increasing responsibilities as you advance in rating. When you assumed your SM3 duties, you began to accept a certain amount of responsibility for the work of others. With each advancement in rating you accept greater responsibility in military matters and in the professional requirements of the Signalman rating.

You will find that your responsibilities for military leadership are about the same as those of petty officers in other ratings. The reason for this parallel is that every petty officer is a military person before becoming a technical specialist.

Although some broad aspects of military leadership are included in this text, the training manual is not designed to give you extensive information on military requirements for advancement to petty officer first or to CPO. Material covering these requirments is found in Military Requirements for Petty Officer 1&C, NAVEDTRA 10057 and should be studied carefully.

TECHNICAL LEADERSHIP

Your responsibilities for technical leadership are special to your rating and are directly related to the nature of your work. The dual role of operating and maintaining a ship's communicaton system is a job of vital importance. It requires an exceptional kind of leadership ability that can be developed only by personnel who have a high degree of technical competence and a deep sense of personal responsibility. At this point, let's consider some of the broader aspects of your growing responsibilities for military and technical leadership—the direction and extent of your responsibilities.

Direction of Responsibility

Your responsibilities will extend both upward and downward. Officers and enlisted personnel alike will expect you to translate general orders given by officers into detailed, practical, on-the-job language that can be understood and executed by even relatively inexperienced personnel. In dealing with your juniors, it is up to you to see that they perform their work properly. At the same time, you must be able to explain to officers any important needs or problems of the enlisted men.

Extent of Responsibility

Even if you are fortunate enough to have highly skilled and well-trained signal personnel, you still will find that training is necessary. For example, you will always be responsible for training lower rated men for advancement in rating. Also, some of your men may be transferred, and inexperienced or poorly trained men may be assigned to replace them. In such a circumstance your skill and experience must be brought into play to bring these men up to Navy standards and to guide their professional development. Chapter 2 of this training manual should prove valuable in assisting you to fulfill your training responsibilities.

WORKING WITH OTHERS.—As you advance to SM1 and then to SMC, you will be taking a greater part in planning for training in your ship. At times this training will also affect a large number of personnel not in your division nor even in your department. It becomes increasingly important, therefore, to understand the duties and responsibilities of personnel in other ratings. The more you know about related ratings, the more complete and comprehensive will be your training plans—especially those requiring an interdivisional effort to achieve their goals.

As your responsibilities for planning with others expand, so also must your ability to communicate clearly and effectively. The basic requirement for effective communication is a knowledge of your own language. Always use correct language in speaking and in writing. Remember that the basic purpose of all communication is improvement of understanding. To lead, supervise, and train other men, you must be able to speak and write in such a way that they can understand exactly what you mean.

A second requirment for effective communication in the Navy is a sound knowledge of the "Navy way" of saying things. Some Navy terms have been standardized for the purpose of ensuring efficient communication. When a situation calls for standard Navy terminology, use it.

Still another requisite for effective communication is precision in application of technical terms. A command of the technical language of the Signalman rating will enable you to receive and convey information accurately and to exchange ideas with others. A person who does not understand the precise meaning of terms used in connection with the work of his own rating is handicapped when he tries to read official publications relating to his work. He is also at a disadvantage when he takes written examinations for advancement in rating. Although it is always advisable for you to use technical terms correctly, this practice is particularly significant when you are dealing with lower rated men. Sloppiness in the use of technical terms is likely to be confusing to an inexperienced man.

KEEPING UP WITH NEW DEVELOPMENTS.–You are responsible for keeping up with new developments within the Navy. Practically everything in the Navy is subject to change and development–policies, procedures, equipment, publications, systems, and so on. As SM1, and even more importantly as SMC, you must make every effort to keep yourself informed about all changes and new developments that might affect your rating or your work.

Some changes will be called directly to your attention, but you will have to look for others. Try to develop a special kind of alertness for new information. Above all, keep an open mind on the subject of new signal and associated equipment. Openmindedness is especially important in the Signalman rating, because the Navy, in an effort to keep parallel with modern advances in communicaton development, is experimenting constantly with new and different high-speed communication devices. These new developments often call for changes in procedures in handling message traffic and sometimes for changes in a complete system.

REQUIREMENTS FOR ADVANCEMENT

In general, to qualify for advancement, you must–

1. Have a certain amount of time in grade.

2. Complete required military and occupational training courses.

3. Demonstrate ability to perform all the PRACTICAL requirements for advancement by completing the Record of Practical Factors, NAVEDTRA 1414/1.

4. Be recommended by your commanding officer.

5. Demonstrate your KNOWLEDGE by passing a written examination based on (a) military requirements for advancement and (b) occupational qualifications for advancement in the Signalman rating.

Advancement in rating is not automatic. Meeting all the requirements makes you eligible for advancement, but it does not guarantee your advancement. Some factors that determine which persons actually will be advanced in rating are (1) scores made on the written examination, (2) length of time in service, (3) performance marks, and (4) quotas for the rating.

The Navy's system provides credit for performance, knowledge, and seniority, and, while it cannot guarantee that any one person will be advanced, it does guarantee that all men within a particular rating will have equal advancement opportunity.

A change in promotion policy, starting with the August 1974 examinations, changed the Passed-But-Not-Advanced (PNA) Factor to the High Quality Bonus Point (HQP) factor. Under this policy, a man that passed the examination, but was not advanced can gain points toward promotion in his next attempt. Up to three multiple points can be gained in a single promotion period. The points can then be accumulated over six promotion periods up to a maximum of 15. The addition of the HQP factor, with its 15-point maximum, raises the number of points possible on an examination multiple from 185 to 200. This gives the examinee added incentive to keep trying for promotion in spite of repeated failure to gain a stripe because of quota limitations.

All of the above information (except the examination score and the HQP factor) is submitted with our examination answer sheet. After grading, the examination scores, for those passing, and the HQP points (additional points awarded to those who previously passed the examination but were not advanced) are added to the other factors to arrive at the final multiple. A precedence list, which is based on final multiples, is then prepared for each pay grade within each rating. Advancement authorizations are then issued, beginning at the top of the list, for the number of men needed to fill the existing vacancies.

Remember that requirements for advancement may change from time to time. When preparing for advancement, and when helping lower-rated men prepare for advancement, check with your division officer or training officer to make sure you have the latest requirements.

Studying for the Test

The Signalman, more so than his contemporaries in other ratings, normally has access to every publication used as reference material for the questions contained on his advancement in rating examination.

Trying to read and study every manual or publication on the signal bridge is a waste of time and effort. We all have a saturation point which most certainly would be exceeded if we tried to study everything. If only someone would produce a phamphlet that indicates exactly which reference material is used in writing the exam. There is such a phamphlet–NAVEDTRA 10052-(), and it is available at your I&E Office.

BIBLIOGRAPHY FOR ADVANCEMENT STUDY, NAVEDTRA 10052-1().–The "Bibliography" is the most important single item when preparing for advancement. This pamphlet is based on the Manual of Qualifications for Advancement, NAVPERS 18068-(), and lists the training manuals and other publications prescribed for use by all personnel concerned with advancement in rate training and writing advancement examinations. Thus, the Bibliography provides a working list of material for enlisted personnel to study in preparation for advancement examinations, and this same list is used by the item writer at the Naval Education and Training Program Development Center.

The first few pages of the pamphlet show the military requirements references which apply to all ratings. This part of the Bibliography is of special importance at the E4/E5 levels, because separate examinations on military subjects are given locally at those rate levels.

The remainder of the booklet contains reference listings by ratings, using the 5-column format shown in figure 1-1.

- Column (1) Ratings. Contains the names and abbreviations of both service and general ratings. All of the references for Signalman are grouped together on one list covering one or more pages.

- Column (2) Publication Titles. Titles and applicable parts of Rate Training Manuals and other publications are shown in this column. Notice that when only certain parts of a book apply as references for a particular rate, then just those parts (paragraphs or chapters) are listed. (See fig. 1-1.) THIS IS THE BIBLIOGRAPHY.

- Column (3) Text Identification Number. This column identifies the references more specifically. The publication and NAVEDTRA numbers listed are the most recent editions, and may contain a letter, such as NAVEDTRA 10780-B. The letter indicates that some significant changes have been made since the previous (NAVEDTRA 10780-A) edition.

- Column (4) Correspondence Course Identification Number. NAVEDTRA number (s) of the correspondence course or courses covering subject matter of prescribed text(s)

Ratings (1)	Publications Titles (2)	Text Identification Number (3)	Non Resident Career Course Identification Number (4)	Applicable Rate Levels (5)
GROUP I. DECK—Continued				
SIGNALMAN (SM) Continued	International Code of Signals Chapters 1 and 4)	H. O. 102		E-5
	Flags, Pennants, and Customs (Chapters 1, 2, 6, 7)	DNC 27 (A)		E-5
	Wartime Instructions for Merchant Ships (Chapters 9 through 12)	ACP 148 (A)		E-6
	Recognition and Identification Instructions - Air, Land and Sea Forces (Chapters 1, 2, 4, 5, Secs. I, IV thru VIII)	ACP 150 (B)		E-7
	*Signalman 1 & C (less chapters 11, 13, 14)	NavPers 10136-C	91292-1	E-6, E-7
	Rules of the Road: International-Inland	CG 169 (1 Sept 1965)		E-8
	Basic Communication Doctrine	NWP 16 (C)	10760-C	E-8
	Shipboard Procedures	NWP 50 (A)		
	(Chapter 10)			E-8
	(Chapter 9)			E-9
	Electrician's Mate 3 & 2 (Chapter 8)	NavPers 10546-C		E-8
	The Communications Officer	NavPers 10780-B	10403-B	E-8
	Watch Officer's Guide	U.S. Naval Institute	10719-4	E-8

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Figure 1-1.—Bibliography format.

described in columns 2 and 3 are listed. In a few cases, completion of the correspondence is mandatory.

- Column (5) Applicable Rate Levels. Except for training manuals that are mandatory, the lowest rate level for which a publication is applicable is listed in this column. If a publication is mandatory, then all of the rate levels that it is mandatory for, are shown. Note that, as is pointed out in the Manual of Qualifications for Advancement, NAVPERS 18068-C, all higher pay grades may be held responsible for the material contained in publications listed for lower rates in their paths of advancement.

Asterisks which appear throughout the listings indicate the Rate Training Manuals whose mandatory completion is specified by the Advancement Manual or Correspondence Courses that are mandatory.

RATE TRAINING MANUALS.–The rate training and military manuals are written using the professional and military quals from the Manual of Qualifications for Advancement as a guide. With a few exceptions, sufficient information is presented in these manuals to cover every qual. Obviously a qual like "encode and decode tactical signals" cannot be realistically covered. Nor can a Secret qual be covered in a Confidential or Unclassified manual. For these types of quals we have to go to other publications for the information. The Bibliography, of course, tells us exactly where to look for the coverage.

This rate training manual and the Military Requirements for PO 1/C cover the majority of the E-6 and E-7 Signalman quals. Bibliography (NAVEDTRA 10052()) references cover those quals that cannot be adequately covered by these two manuals. Also, keep in mind that many of your test items may be based on information contained in Signalman 3/2 and Military Requirements for PO 3/2 because you are responsible for the quals of the lower rates. So always include these 3&2 manuals on your list of materials to study for advancement. It's no insult to break open a 3&2 manual to refresh your knowledge. You can bet that there are Chief and Senior Chief Signalmen who wish they had given the Signalman 3&2 manual a little more attention before the last E-8/E-9 exams.

The Advancement Examination

All of the Signalman Advancement Examinations are written by an item writer (E-9 Signalman) at the Naval Education and Training Program Development Center (NAVEDTRAPRODEVCEN), Pensacola, Florida. The item writer is responsible for constructing the 150 question professional questions of the SM1 and SMC examinations. The writer has a bank of many items that have been used on previous examinations and he will use many of the items from his bank when he constructs an examination. He will also write some new items.

The examination questions are grouped by subject matter into categories, or sections. There may be from 5 to 12 sections on a particular test. Each item is carefully checked and rechecked to make sure it is a valid item.

Unfortunately, there is an unavoidable delay built into the examination system, since the Bibliography is printed and distributed about one year in advance. For example, the Bibliography for the 1975 exams was printed in the spring of 1974. As soon as the Bibliography is made available to him, the Master Chief Signalman at the NAVEDTRAPRODEVCEN, begins writing the Signalman exams for the following year. During this period of time many changes may be made to the reference publications listed in the Bibliography. These changes may invalidate some of the exam questions. However, this will not affect your examination grade.

On the day that you take the advancement exam, the Master Chief Signalman at the

NAVEDTRAPRODEVCEN also takes that same test. For your benefit, he thoroughly checks every item on the examination to make sure none are outdated. Any outdated questions that he finds will not be considered when the test is graded. This has the same effect as counting all four answers correct, because the answer you pick for an outdated question is correct, no matter which one you select. Thus, you do not have to worry about test items that contain superseded information.

Two important restrictions are placed upon the item writer: First, his examination must cover all of the quals, as indicated by the Manual of Qualifications for Advancement, NAVPERS 18068-(), for the particular rate. He may also include questions that cover quals for lower rates within the Signalman rating. In other words, when you take the SMC exam you may have to answer questions that are based upon SM3, SM2, or SM1 quals.

Second, his references are restricted to those listed in the Bibliography for Advancement Study, NAVEDTRA 10052(), or the secondary references that are referred to by one of the references in the Bibliography. Let's say, for example, that somewhere in the SM 3/2 Rate Training Manual, which is listed in the Bibliography, a reference is made to a publication which is not listed in the Bibliography, then that publication is also fair game.

Centralized Assignment System

The basic concept of centralized assignment is simple. It provides the capability of matching total enlisted personnel resources against total requirements. Under this method, all enlisted members, with the exception of nondesignated SN/FN/AN, are under the exclusive detailing control of CHNAVPERS who determines the member's ultimate assignment.

Manning Control Authorities

The names of the Enlisted Personnel Distribution Offices (EPDOPAC and EPDOLANT) have changed. EPDOCONUS has been closed, and the activities for which that organization was previously responsible are now monitored by BUPERS. The role of these units is now one of monitoring the manning of fleet and CONUS activities. The three new Manning Control Authorities are:

1. Fleet Enlisted Personnel Requirements and Readiness Center–Atlantic (Formerly EPDOLANT).

2. Fleet Enlisted Personnel Requirements and Readiness Center–Pacific (Formerly EPDOPAC).

3. Requisition Monitor Branch of BUPERS (PER-B20).

These three Manning Control Authorities will communicate their requirements to CHNAVPERS via a requisition system.

Personnel Requisition System

The Personnel Requisition System was developed to enable BUPERS to determine personnel requirements for activities, Navywide. The requisition is a document which is prepared by the Manning Control Authorities (MCAs) and lists the consolidated personnel requirements for their area of cognizance, in priority sequence up to eight months in advance, and is updated monthly. Each individual requirement (by rate, rating, and NEC, if appropriate) on requisition number which must appear on orders issued to satisfy that requirement.

An individual requirement may be generated in the requisition for any of the following reasons:

- To Fill an existing vacancy
- Relief of an individual on board
- Fulfillment of a new billet

In all cases, the requirement can be identified in the requiring command's 1080-14, prepared by the appropriate PAM1. The MCA will then extract the individual command requirements, develop a master listing of requirments. and assign a priority to each requirement.

PRIORITIES.–It becomes apparent that the detailer requires some guidance as to which requirements have precedence. To provide this quidance a priority is assigned to each requirement, from each MCA, considering such factors as command employment (deployment CNO SPEC OPS, etc.), one for one billets, on board population in a given unit (6 SMs on board, 10 SMs allowed), and various other elements. The detailers are required to make assignments in strict accordance with requisition priorities.

Types of Duty

Currently, six types of duty exist for rotation purposes.

Type 1. Shore Duty: CONUS, fleet shore duty and certain fleet activities.

Type 2. Sea Duty: Arduous sea duty in deploying ships/units homeported in CONUS, Hawaii, or Alaska.

Type 3. Overseas Shore Duty: Duty ashore outside CONUS where prescribed DOD tours are 36 months or less. Counts as sea duty for rotation purposes, but may not completely fulfill an individual's sea tour.

Type 4. Non-Rotated Sea Duty: Sea duty in ships/staffs/units listed in OPNAVINST 4600.16 (for example, units homeported in RVN). Tour lengths are defined by the area tour for the local of assignment. Counts as sea duty for rotation purposes, but may not completely fulfill an individual's total sea tour obligation.

Type 5. Neutral Duty: Duty in CONUS, Hawaii, or Alaska homeported ships/staffs/units which normally do not operate away from homeport, except for brief periods. Not credited for either sea or shore rotation. Sea Duty Commencement Date (SDCD) or Shore Duty Commencement Date (SHDCD) is adjusted to compensate for the neutral time. You should expect another sea assignment upon completion of neutral duty.

Type 6. Preferred Overseas Shore Duty: Duty overseas where the prescribed DOD tours are 36 to 48 months. Three possible alternatives exist within the application of this range of tour length.

1. Individuals normal shore tour is less than the area tour. In this case, the shore tour will be extended to coincide with the area tour. Other extentions will not normally be granted.

2. Individual's shore tour coincides with the area tour. No adjustments necessary. Extensions will be considered on a case basis.

3. Individual's shore tour is longer than the area tour. Initial orders will be issued for the area tour. Upon request, an extension up to normal shore tour limits or 48 months total time in billet, whichever is less, may be granted. Counts as shore duty for rotation purposes; extension requests will be viewed accordingly.

Duty Preference

An accurate and up-to-date Duty History and Preference Card, NAVPERS 1306/34, should be on file with the detailers for all individuals under their detailing responsibility. If you have never submitted a preference card, do it now. Without it, your detailers only assumption is that your preference is simply "anywhere world." Everyone is encouraged to submit a new card several months prior to their Projected Rotation Date. If you neglect to submit a new card prior to transfer, your detailer will assume that your old one is still correct.

Accuracy of information may affect your next duty assignment. As changes occur in information concerning service schools completed, number of dependents, desires, etc, you should submit a new card. The biggest cause of misunderstanding between a man and his detailer is an out-of-date duty preference card. Let's face it, after a few years you probably won't be able to remember what you put on your duty preference card. So make a copy of it for your own files, and break it out every now and then and look at it. If there has been a change, even if you consider it a minor change, submit a new card. For example, we've just mentioned submitting a new card for a change in dependents. Most of us consider that to mean when a new baby is born. But how about a decrease in the number of dependents, say when your daughter gets married. With fewer dependents, you may be eligible for a wider range of duty assignments. Your assignability definitely improves with less dependents.

Eligibility for duties should be carefully investigated. If you are not qualified for the duties you have requested, then your request is essentially invalidated. If you are not sure of the qualifications required, check with your Career Counselor or Personnel Office for directives or instructions which may apply to the assignment you desire.

You should indicate a different choice in each of the preference boxes. This will maximize the possibilities for your detailer to assign you to duty you desire. The detailer will always consider your first choice first, and if at all possible, he will assign you to that duty. Therefore, nothing is gained by repeating your preferences. If assignment to your top choice is not possible, then the detailer has to know your alternate selections in order to best fulfill your desires.

The locations you indicate as duty preferences may be broad (anywhere 11th Naval District) or quite specific (Seattle, NTC San Diego). But your chances are much better with broad preferences.

It makes sense to include both. If your first choice is specific, add a broad area as the second or third alternative.

The remarks section is particularly important. Include in remarks any information which may influence your assignments. Following are a few important items that should be explained in the remarks section:

Is your wife a teacher?

Do you speak a foreign language?

Do you have a retarded or handicapped child?

Do you have any special qualifications?

Do you have any deficiencies or physical problems that do not appear in your service record which might be a handicap in an instructor or shore patrol billet?

Detailing

The job of a detailer is a thankless one. He must treat each decision as if it is the most important decision he will ever make. Considering his instructions and the restrictions placed upon him, his task seems impossible. However, a surprisingly high percentage of individuals are assigned to a billet of their choice. Regretfully, every individual cannot be assigned to the area or billet of his preference and the detailer must be prepared to justify his detailing decisions to everyone concerned.

The basic Bureau policy governing the assignment of all enlisted personnel is that every effort will be made by rating control officers and detailers to assign personnel to duty stations in accordance with their preferences, commensurate with eligibility, availability of billets desired, and in accordance with the priorities established by the Chief of Naval Operations and the manning control authorities.

To elaborate upon these factors, there are at least twenty potential variables that the detailer must consider in making a specific assignment. Taken together, they constitute a complex decision-making process which may frequently give the appearance of a mystic rite. The following list includes the variables most frequently considered by the detailer in the hope of reducing the mystery inherent in the detailing business.

- Individual Variables

1. Rate, rating, NEC–obviously the first consideration in any assignment.

2. Previous performance and evaluation of potential performance–particularly when considering assignment to special duties such as instructor and recruiter.

3. Specialized training or qualifications held other than NEC identified skills.

4. Service history, active duty base date, obligated service career status, and advancement status.

5. Career rotation status–sea/shore duty history, and policy concerning current duty station (neutral duty, etc.)

6. Security clearance or clearability

7. Training required to satisfy next assignment and career training pattern.

8. Applicable guarantees or incentives–first reenlistment incentive, twilight tour, etc.

9. Any special considerations known to the Detailer–dependent's status, medical problems, etc.

- Billet Variables

1. First there must be a valid billet vacancy to be filled, requiring a certain rate and NEC.

2. The assignment, when considered with all others of the rate involved, must contribute to maintaining a balance in manning levels between the two fleets and other manpower users.

3. The assignment must respond to the established priorities.

4. The manning rules of the activity involved.

5. Activity employment schedule.

6. Any special rotation plans which apply to the activity.

7. Any special billet requirements–factory training, foreign language skill, special screening, security clearance, etc.

- External Variables

1. Cost of the move. All other factors being equal, the least costly PCS move is ordered. Detailers must assess such factors as distance involved, number of dependents, and location of household goods in arriving at cost judgments.

2. Time frames of PRDs, billet vacancies, class convening dates, leave and travel time, must all coincide.

3. Constraints imposed by higher authority. Overseas area tour lengths, number of dependents allowed, sole surviving son restrictions, etc.

4. Tour lengths for the type of duty, activity, location and rating must dovetail with obligated service and career history of the individual.

This list does not include all possible variables, but it should indicate that much thought, time, and effort goes into making your actual assignment. In matching the right man for the right job, the Bureau continues to strive for more efficient manpower utilization that brings billets, skills, and personal desires into close harmony and provides timely response to Navy's changing manpower requirements.

Rating Control Unit PERS-5153

The Signalman Rating Control Unit PERS-5153 is located in Wing 8 of the Arlington Navy Annex. Anytime you are in the Washington, D.C. area, drop in and talk to your detailer. There are reserved parking spaces, at the Annex, designated exclusively for you and your dependents while visiting your detailer. Within the Unit there is a Rating Control Officer and two Signalman detailers, detailing all SMs E-3 thru E-9.

In order that you may more easily communicate with your detailer, the Signalman Rating Control Unit is manned from 0800-1900, Monday thru Firday and 0800-1300 on Saturday (Washington, D.C. time). Phone Numbers:

Autovon 224-8469, 224-8545, 224-2574
Commercial 202-694-8469, 202-694-8545, 202-694-2574

Unfortunately, the detailers receive an occasional call or letter from a Signalman who is upset about his orders. First understand that personal telephone conversations and letters are informal, unofficial, and subject to misunderstandings by both parties. In order to keep these conversations informal, the detailers never use unofficial means to convey "promises" or "guarantees."

Through personal letters and conversations, your detailer will listen to your inquiries, answer questions, advise you concerning appropriate action, or recommend a specific action such as submitting a request to accomplish your goal. As a matter of policy, official action will only be taken on written requests submitted via your commanding officer through the chain of command. This is for your protection, as well as the protection of your command and shipmates.

TOUR LENGTHS.–The length of tours for Signalmen is determined by analysis of the distribution of billets between sea and shore duty, retention rate, and related manning level projections. As billet structures and activity allowances change with time, so do tour lengths. For this reason, specific tour lengths cannot be included in this manual. However, you can determine the tour lengths for your rate by contacting your Personnel Office, or by calling your detailer.

OUT-OF-RATING ASSIGNMENTS.–Unfortunately, there are just not enough shore billets written for Signalman to allow shore assignments to those billets alone. Therefore, we (as well as many other ratings) are assigned to billets out of our rating (Shore Patrol, Armed Forces Police, MAA, Career Counseling, Drug Abuse Specilaist, Recruiting, Courier, Secuirty Groups, etc.) to alleviate this situation. If we did not have these extra out-of-rating billets, our shore duty opportunity would be considerably reduced. Keep this in mind if you receive orders ashore which are not quite what you desired–chances are you probably were assigned pretty close to the area of your choice.

TRANSFER REQUESTS.–There is an apparent misunderstanding of the Enlisted Transfer and Special Duty Request (NAVPERS 1306/7) and the Duty History and Preference Card (NAVPERS 1306/34). These forms are not interchangeable, and they serve two completely different functions. Essentially, the preference card is a permanet record maintained on file for use when you become available for routine assignment. A new preference card is submitted whenever there is a change in your individual situation. On the other hand, the Enlisted Transfer and Special Duty Request form is to be used when requesting a single, specific program. It is answered, yes or no, on a one time basis, but not retained for future reference.

There are some types of duty that require a special request, NAVPERS 1306/7, or a letter request with specific information. Some of these are New Construction, Recruiting, Drug Abuse Specialists, Minority Affairs, Courier, etc. If you are in doubt as to which form to use, please call your detailer; he will be happy to answer your questions.

Quality Control Program

The intent of the Quality Control Program is to assist in ensuring that our career enlisted force consists of those members who have shown that they are capable of accepting the challenges of a Naval career. To this end, certain restrictions on reenlistment eligibility are an integral part of Quality Control. From the detailing point of view it must be kept in mind that if you are ineligible to extend or reenlist because of any of the restrictions set forth below, you will not be assigned to any duty for which obligated service is required beyond that which you are eligible to incur.

The following specific restrictions exist under the Quality Control Program:

- Members serving in a first enlistment must have at least passed an examination for advancement to pay grade E-4 in order to be eligible to reenlist or extend. Exceptions exist to allow members to extend for periods of less than one year for various personnel actions (entry into SEAVEY, establish a PRD, complete a cruise or deployment, etc.).

- To be eligible to reenlist or extend beyond twenty years active day-for-day service a member must have at least passed an examination for advancement to pay grade E-7 subsequent to completion of eighteen years of service. Extensions for periods of less than one year for various personnel actions, as noted in the preceding paragraph, may be executed without regard to this professional growth criterion.

- To be eligible to reenlist or extend beyond twenty-three years' active day-for-day service, a member must be serving as a chief petty officer or above. Again, extensions of less than one year for various personnel actions are permitted.

Waviers to any of the above criteria may be granted in meritorious cases. An administrative board-the Reenlistment Quality Control Review Board-exists within the Bureau for purposes of recommending meritorious waivers. Rating Control Officers vote on all cases involving ratings for which they have detailing responsibility.

Special Duty

If you are interested in, and qualified for any Special Duty, ensure that your preference card reflects your choices. Following are some of the special duties for which Signalmen are eligible.

MAAGS/MISSIONS.–Exceptionally well qualified and motivated enlisted men are needed to fill the numerous billets at MAAGs/Mission, NATO Commands, U.S. Military Group, Joint/Unified and Combined Staffs and Defense Communications Agencies throughout the world.

DRUG ABUSE EDUCATION SPECIALIST.–There have been approximately 4000 volunteers for the 105 currently authorized Drug Abuse Specialist billets, both sea and shore. Highly qualified personnel desiring assignment to this program may still volunteer by submitting a NAVPERS 1306/7.

INSTRUCTOR DUTY.–Some of the shore duty billets for Signalmen are in Instructor

Duty. You are encouraged to volunteer for Instructor Duty if you are eligible for shore duty and qualified in accordance with chapter 5 of the Transfer Manual.

RECRUITING DUTY.–The number one priority shore duty in the Navy today is recruiting duty. We are dependent now, as never before, upon the quality of our recruiters. For this reason the criteria for selection to that duty are such that only the highest quality volunteers are chosen.

There are currently 3160 enlisted canvasser billets in recruiting. You are encouraged to volunteer for recruiting if you are eligible in accordance with chapter 4 of the Transfer Manual. Even though recruiting duty may be indicated as first choice on your preference card, a special request (NAVPERS 1306/7) should be submitted in order that a command recommendation is available for consideration.

Assignments are sent to one of the 40 recruiting districts by BUPERS. The district commanding officer will then inform the man of his specific assignment. When indicating duty preferences use only a recruiting area or district from the following list:

AREA ONE	AREA TWO
BOSTON ALBANY NEW YORK BUFFALO	PHILADELPHIA WASHINGTON D.C. RICHMOND RALEIGH

AREA THREE	AREA FOUR
COLUMBIA ATLANTA NASHVILLE MEMPHIS MONTGOMERY JACKSONVILLE MIAMI	CLEVELAND PITTSBURGH COLUMBUS INDIANAPOLIS LOUISVILLE

AREA FIVE	AREA SIX
MILWAUKEE DETROIT ST. LOUIS CHICAGO	MINNEAPOLIS DES MOINES OMAHA KANSAS CITY DENVER

AREA SEVEN	AREA EIGHT
ALBUQUERQUE LITTLE ROCK OKLAHOMA CITY DALLAS HOUSTON SAN ANTONIO NEW ORLEANS	SEATTLE PORTLAND SAN FRANCISCO LOS ANGELES

Orders Modification

Your orders will be cut in sufficient time to give you at least sixty days notice prior to your actual transfer date. If you have questions about a set of orders that you have received, contact your detailer and he will do the best he can to help.

SIGNALMAN RATING

You have been a Signalman long enough to realize the importance of your rating to the Navy. Signalmen, along with Operations Specialists, Radiomen, and Electronics Technicians, are essential members of the operations department team. A former CNO, speaking of the operations department's task of providing external communications, operating the CIC, and repairing electronic equipment, assessed the significance of the operations department in these words:

> "The effectiveness of the many changes taking place in ships, in equipment, and in weapons rests more and more heavily upon the capability and output of the operations department. The men who man, maintain, and give effect to the components of the operations department exert a

> preponderant influence upon the quality of the ship's total capability."

The specialty of the Signalman is close-in visual communications–rapid, secure, and effective. In addition to sending and receiving messages by flashing light, semaphore, and flaghoist, Signalmen also must be familiar with operation of voice radio and its procedures. Moreover, a Signalman must prepare headings and addresses for outgoing messages, encode and decode message headings, and handle, route and file messages. He must be the authority on how, when, and where to display ensigns and personal flags during salutes and personal and national honors, besides rendering the proper passing honors to naval vessels. A Signalman must be expert when it comes to sending and receiving visual recognition signals and the duties a lookout must perform. Additionally, he must maintain his visual signal equipment, which includes repairing and manufacturing signal flags, pennants, and ensigns.

Motivation

The Navy has taken great strides in improving its living standards. The food is better and even the pay has become reasonable. These factors fulfill a man's basic survival and security needs, but they are not motivating factors. We have to look elsewhere for factors that will motivate him. When we learn to recognize motivating factors and use them correctly, we will obtain better results and our subordinates will be happier in their jobs. We are all capable of performing "impossible" tasks if motivated properly.

No one has all of the answers to effective management, however, the highest degree of effectiveness is realized when management techniques are based upon the following list of assumptions:

1. People are not lazy, indifferent, uncooperative or uncreative. Work is as natural as play or rest.
2. Tight controls and threats of punishment are not the only means of getting men to work. Men will exercise self-direction and self-control toward objectives to which they are committed.

3. Every man must have a meaningful job. Without meaningful work he is bored and not of much use.

4. Man is a growing, learning animal who craves recognition.

5. Most men learn to accept and to seek responsibility.

6. The average man's intellectual potentials are only partially utilized. Most are capable of a high degree of imagination, ingenuity, and creativity.

7. Man by his nature is gregarious. One of his basic urges is his desire to be an integral part of some group. He must feel that he is an important, contributing member of the group.

Do we, as managers, really consider the needs and desires of our subordinates? Most of us have our own preconceived ideas of what a person's needs are. We try to compare a subordinate's reaction, to various management techniques, to what we think our own reactions would be under similar circumstances. Thus, we set up a model subordinate, usually based upon ourselves, and we decide to manage according to our model's desires, and treat everyone the same–be consistent. This is entirely the wrong approach. In the first place, no two individuals are alike. We all react differently to different situations. Therefore, a good manager must know and understand his men and be flexible enough to adjust his management techniques according to the individuals(s). Flexibility is a key to successful management.

Job assignments should be planned to challenge the ability of each individual. When a man masters one task make his next one just a little more difficult. Always keeping in mind that, for motivating purposes, succeeding is better than success. For example, sending semaphore is a great challenge to a new Signalman striker, but once he become a proficient sender, his job must be changed. If not, he will become bored and his efficiency will drop. If it's not possible to change his job right away, then encourage competition among the

SMs. Use any challenge you can think of to keep him interested and his high performance should continue until his job can be changed.

Each subordinate must be assigned responsibility no matter how large or small the responsibility. We could make many changes in this area. For example, in most compartments a card is posted on the bulkhead designating the man responsible for that compartment. Normally, the designated man is a senior petty officer. Let's change that. Why not designate the compartment cleaner himself as being responsible for the appearance of the compartment. When he realizes that he, and not his senior petty officer, will have to answer for the compartment if it is not ship-shape, he will take more interest and will do a better job. He will also work harder for another reason. He now knows that when he does a good job, he will receive the "well-done" himself.

Many of the factors used to motivate an individual can also be used to motivate a group. Certainly, a good Signal gang must function as a group.

To be effective, all of the efforts of your Signal gang must be group efforts for the accomplishment of group goals. Competition within the group should be encouraged. A Signalman takes great pride in the fact that he was the first to see a distant light. Likewise, competition with other groups can be stimulating. "Our Signal Gang can send and receive messages quicker than any other ship in the force," or the "the OS Division softball team can beat any team on the ship."

Whenever possible, group decisions should be encouraged. For example, during a pre-exercise briefing, why not ask the group for opinions? "How do you think we should handle this part of the exercise, Jones?" Listen to your men and respect their opinions. They may even come up with a good idea that you hadn't thought of. Every man will naturally work harder toward an objective, if, he took part in making the decision. He now has a personal interest in the task.

Therse are some of the ideas that can be employed to improve individual and group performance. Certainly, there are many others. The important thing is that we, as managers, must consider morale and retention, which go hand-in-hand, two of our most important responsibilities. We should occasionally examine our management techniques and keep an open mind for new and useful methods. The new Navy management trend is toward a softer approach, recognizing individual needs. However, the strong stern approach is still available for use when necessary. The next few years are going to be very challenging to all of us in the Naval service. Challenge is our lifeblood, the driving force that keeps us going. Without it, there is nothing. Admiral Halsey once said–

"There are no great men. Great men are just normal men who are forced to meet the greatest challenge."

CHAPTER 2

ADMINISTRATIVE AND TRAINING DUTIES

In *Signalman 3 & 2*, the discussion on logs and files was limited to the ones a signal operator is required to keep. This training course covers logs and files maintained on the signal bridge and also those kept by the entire communication organization, some of which Signalmen are concerned with only indirectly.

Obligation of lower rated men for logs and files is limited to data entered in the records. The leading Signalman's responsibility encompasses not only his own entries, but all other entries to logs and files on the signal bridge. He also should be familiar with the contents, use, and location of such records as the radio central log, communication center file, and tickler file. Every message handled by a ship or station is placed in one or more such files.

An accurate record of all messages sent or received is a prime essential for any good communication organization. It is the leading Signalman's obligation to ensure that logs and files on the signal bridge are maintained properly.

This chapter gives a complete coverage of files and logs maintained by the communication department. Keep in mind, however, that different ships and stations do things in different ways. This section discusses mostly those practices and procedures that have become, through regulation and custom, fairly well standardized. There is more than one way of doing a thing: this section will explain a good way.

Although there are several individual files, they can be divided into mandatory files, which must be maintained, and optional files, which are set up, as necessary, to meet the needs of individual communication organizations.

MANDATORY FILES

The visual log, required by DNC 5 to be kept on the signal bridge, must contain, along with a record of every message sent by visual means, a complete history of each watch.

All signals (from the *Allied Naval Signal Book* or other signal books) sent or received must be recorded in the visual log. Information required to be logged includes date, time of receipt (or time of delivery if a message, or time of execution if a signal), originator, addressee, and method by which sent or received. The signal itself must be logged, but not the meaning of the signal. (Never, under any circumstances, log the meaning of any signal in the signal log.) The log also contains identification data on all other visual traffic, such as the date and time group of a message sent by light or semaphore. Nontactical traffic will be logged by date-time group/time or semaphore. Nontactical traffic will be logged by date-time group/time group or the letters "BT" followed by the TOR/TOD, if no date-time group is assigned.

In addition to visual traffic, all noteworthy events that affect the visual watch must be logged. Such data as exchanging calls, casualties to visual equipment, change of local time zone, and relieving the watch are also entered in the log.

The visual log will be kept with a new page starting at the beginning of each radio day, using Greenwich mean time. RADIO DAY as it applies to the visual signal log, is the time the visual watch is set each day at (0000Z).

Both at sea and in port the visual log is kept on the signal bridge. It is maintained by the watch supervisor, and is checked constantly by the leading Signalman for accuracy and completeness.

Log entries must never be erased. If a mistake necessitates a change in the log, a single line is drawn through the original statement, then the correct entry is made adjacent to the original entry. The person making a change initials it. Entries in the log should be as neat as possible.

It is absolutely necessary for the log to be complete and accurate.

Old signal logs are retained on board a ship or station for 6 months, at which time they may be destroyed, unless logs contain information of historical or continuing interest.

Besides the visual log, a signal station file is maintained by signal bridge personnel. This signal station file is a chronological record of all visual traffic handled by the signal gang. With the exception of tactical signals, it contains a copy of every message sent, received, or relayed by visual facilities of the command. Copies of these messages must bear the operator's services. They are filed in the station file in date-time group order. The signal station file is held on board for 1 month, then it is destroyed.

COMMUNICATION CENTER FILE

In addition to the logs and files on the signal bridge, the leading Signalman also is concerned with files maintained by Radiomen. The communication center file contains a copy of every message addressed to or originated by the command–regardless of whether messages were sent in plain language or encrypted, or by radio, visual, mail, or other means. All messages are filed together in order of DTG and, for this reason, the file sometimes is referred to as the date-time group file. Classified messages here are filed in either of two ways–in encrypted form, or by dummy or filler. A dummy or filler copy is a form showing only the message heading.

Plain language translations of classified messages are stowed in the cryptocenter file. Top Secret messages are stowed here separately. Messages of other classifications usually are filed together.

If there is need to refer to an old message, and the location of the file is unknown, check first in the communication center file. If the message is unclassified, it will be found here; if classified, an encrypted or dummy version will be indicated. From this information it will be known that the message is in the cryptocenter file.

The communication center file is kept in the communication center and is maintained by the Radiomen. Old messages may be destroyed at the end of 1 month, with the following exceptions: Messages incident to or involved in any claim or complaint of which the command has been notified must be retained for 2 years or when the claim has been fully satisfied, whichever is earlier. Messages that refer to distress or disaster are retained for 3 years. Messages of historical or continuing interest must be retained permanently.

RADIO CIRCUIT LOGS

A radio circuit log is a continuous record of everything that happens on a particular net. Like any log maintained by the communication department, erasures of entries are not permissible in radio circuit logs. Any necessary changes must be made by drawing a single line (or typing slant signs) through the original entry and indicating the changed version next to the original entry. Any operator making alterations must initial all such changes.

Three kinds of circuit logs are maintained in radio central: radiotelegraph, radioteletypewriter, and radiotelephone logs.

Radiotelegraph Logs

A complete radiotelegraph log provides the following data:

1. All transmissions heard, regardless of origin, completeness, or whether addressed to a receiving station.
2. Times of opening and closing the station.
3. Causes of delay on the net or circuit.
4. Adjustments and changes of frequency.
5. Any unusual happenings, such as procedure and security violations, or interference.

When opening a net, or starting a new day's log, an operator writes or types his name in the log. When the watch is being relieved or when securing the net, an operator must sign his name on the log.

An entry must be made in the radiotelegraph log at least every 5 minutes. If the net was quiet, the operator simply logs "No signals." Upon receipt of a message, it must be written out fully in the log or recorded on a message blank. If recorded on a message blank, sufficient details must be entered in the log to identify the message. Normally an operator logs the complete heading, followed by the notation "See files."

Radiotelegraph logs may be destroyed after 6 months unless they relate to distress or disaster, in which situations they must be kept for 3 years. If logs are of historical or continuing interest, they must be retained indefinitely.

Radioteletypewriter Logs

Radioteletypewriter logs may consist either of page copy or perforated tape. Page copy may be wound on a continuous roll, or it can be cut into pages for insertion into a more accessible file. If the teletypewriter is not equipped with an automatic time clock, which stamps the time on perforated tape and page copies of messages, an operator must enter the time on incoming tape or page copy at least every 30 minutes. The disposal schedule for radioteletypwriter logs is the same as for radiotelegraph logs.

Radiotelephone Logs

Setting up radiotelephone transmitters and receivers and patching them to their remote control stations are responsibilities of Radiomen. Actual radiotelephone operations, however, may be conducted by any one of several different ratings, including Signalmen. In addition to radio central and the bridge, CIC also controls radiotelephone circuits.

Radiotelephone circuits manned on the bridge and in CIC are tactical circuits such as the maneuvering net, task force command, and combat information nets. Complete logs required on these circuits are maintained by Operations Specialists in CIC. Modified logs are authorized for other types of radiotelephone circuits. Completeness of coverage and degree of detail vary according to type of ship, availability of operators, and information handled on the circuit. Radiotelephone nets manned by Operations Specialists are logged in pencil in ledger-type logbooks. Radiotelephone logs kept by Radiomen are typewritten on a standard log form. Radiotelephone logs must meet the same general requirements as radiotelegraph logs. Retention and disposal requirements also are the same as for radiotelegraph logs.

Because radiotelephone messages sometimes are dictated at a fairly lively writing pace, time can be saved by logging equivalent prosigns in place of prowords heard. Thus, EXECUTE TO FOLLOW can be copied as $\overline{\text{IX}}$, BREAK as $\overline{\text{BT}}$, and so on. Don't spell out numbers; record them as figures. Use commonly understood abbreviations. Such shortcuts are perfectly all right as long as the log meets one simple test: There must be no doubt regarding what was transmitted.

OPTIONAL FILES

Besides mandatory files just described, most ships need some additional files. These extras are called optional files because they are not required by DNC 5. They may, however, be stipulated by a ship's communication organization. In such an instance, they are as necessary as mandatory files. A brief explanation of some of the most commonly used optional files follows.

TICKLER FILE

A tickler file is a temporary arrangement, holding copies of messages requiring a reply. Usually it is kept on a clipboard near the communication watch officer's desk.

Assume that a ship receives a BuMed message bearing DTG 081704Z. It reads: REPT QUANTITY PLASMA ABOARD IN EXCESS NORMAL REQUIREMENTS . NEXT THREE MONTHS. The message is routed to the medical officer for action, and a copy goes on the incoming section of the tickler file. This method of filing the message duplicate is a constant reminder to the communication department that some action remains to be taken on that particular message. When the medical officer prepares a reply, the tickler copy is removed and placed in a permanent file.

If a ship sends a message that requires a reply from another command, a copy is placed in the outgoing section of the tickler file, to be removed when the reply is received. If the message requires replies from several addressees, the outgoing section of the tickler shows who has or has not answered.

PROOF FILE

Occasionally the drafter of a message may say something different from what he meant to say, or may omit something he fully intended to include. The "proof file," sometimes called the "alibi" or "evidence" file, consists of an originator's rough drafts. It is just what its name suggests–a communicator's proof if an originator thinks his message did not go out as he wrote it. Some ships file these copies separately; others staple them to smooth copies in one of the permanent files.

EMERGENCY DESTRUCTION

A member of the communication department is concerned with two types of destruction–routine and emergency.

Routine destruction consists of destroying superseded and obsolete publications, rough drafts, carbon paper, and similar items that are placed in burn bags after serving their purpose. Routine destruction is accomplished frequently so as to hold to a minimum any material that would have to be destroyed in a hurry during an emergency. The number of burn trips a week or month depends on the amount of classified matter handled by a ship.

Emergency destruction of classified material may be authorized at any time, when deemed necessary, to prevent its capture by an enemy. Whenever a ship is in danger of sinking, or is severely disabled, action is taken in accordance with that ship's emergency destruction bill. Emergency destruction is an all hands evolution, from communication officer to striker. A destruction bill details the method and order of destruction of classified matter. Each man in the communication division is assigned responsibilities by duty and watch instead of by name. To ensure effective action despite personnel casualties, an emergency destruction bill provides alternates for each billet.

Destruction plans call for the highest degree of individual initiative, both in preparing for and in actually carrying out required destruction. In emergencies, when classified material is subjected to compromise through capture, it may be necessary to start destruction without waiting for specific orders.

Cryptographic material carries the highest priority for emergency destruction. Insofar as humanly possible, it must not be permitted to fall into enemy hands. After cryptomaterial, other classified material in order of classification is destroyed–highest classified material first.

Destruction by fire is the preferred method for all combustible materials. Oil or chemicals may be used to facilitate burning. If a ship is in deep water, and time does not permit burning classified publications, messages, files, and logs, they may be placed in weighted perforated canvas bags and jettisoned. Classified equipment also may be jettisoned in water deep enough to preclude any possibility of recovery. Water depth of over 100 fathoms usually is considered sufficient to prevent an enemy from conducting successful salvage operations.

If a ship is in shallow water (100 fathoms or less), combustible classified material must be burned. It may be jettisoned only as a last resort. Classified communication equipment must be smashed beyond recognition before jettisoning in shallow water; unclassified communication equipment should be demolished beyond repair.

Sufficient weighted perforated canvas bags and tools, including sledge hammers, screwdrivers, and wire cutters, are always kept in communication spaces for use in emergency destruction.

MILITARY RESPONSIBILITIES

Signalmen have learned by this time that there is a big difference between doing a job themselves and having others do it. There is more to supervising than telling a striker to perform a task, then walking away and expecting him to fulfill the orders. Something more is involved: It is called leadership, and it is up to the man to make leadership work for him. This discussion of leadership is focused on what it must mean to him and how he can make it work as a First Class or Chief Signalman.

Basically the problem will always be the same: getting the job accomplished with the men, materials, and time allotted. Jobs vary, of course. To illustrate, a ship may be faced with a week-long convoy exercise or a shipyard overhaul. Regardless of the event, Signalmen will look to their leader for guidance, And they have every right to expect it, because he has the experience. The men can be given necessary guidance by organizing them for the jobs at hand, by showing them the best way to do the jobs, and by supervising them until tasks are completed properly.

SHIP'S WORK

As the leading Signalman whether you are on an LST with 3 men in the gang, or on a large cruiser or carrier with 18 or 20, the job of performing a ship's work will be the same. The leading Signalman is the organizer. It is your responsibility to assign your men to their cleaning spaces, watch stations, liberty sections, and such special details as bunting repair, damage control petty officer, police petty officer, and mail petty officer.

It is up to the leading SM to see that the maximum amount of work is accomplished in the time allotted. He must not wait until after morning quarters to decide that his division will chip paint that day, and then let all hands stand around until the necessary gear is made available. Nor should he suddenly determine that halyards need replacing, only to discover—after ordering the men to stand by—that there isn't enough halyard on board to do the work.

In a larger ship the leading Signalman will have other petty officers assisting him. It is his responsibility, however, to ensure that all division work is accomplished. He must remember that authority can be delegated—but not responsibility.

The key to any smoothly run division is: Plan, organize, direct, and control. Organize ship's work well in advance. A routine day may have some men cleaning signal lights, some working on preservation of weather decks, while others are replacing a worn halyard or washing signal flags. Only after everything is planned efficiently can one of the petty officers be directed to take charge of a group and make sure that the work is carried out. This delegation of authority frees the leading Signalman for the major task of overall control of his division.

SAFETY PRECAUTIONS

When any task is planned for men in a division, one important consideration is safety precautions. It is up to the supervisor to see that safety precautions are never overlooked or bypassed. If a job requires sending men aloft, it is his responsibility to determine that permission is obtained from the OOD, that all electronic equipment is secured and tagged, and that the man is equipped with a safety line and has a tender standing by.

If the job is chipping paint or wire-brushing a metal surface, the supervisor must make sure his men wear safety goggles and that power equipment is grounded properly. When painting in a closed compartment, he must take care that the space is ventilated adequately, and that his men don't remain in the compartment for long periods of time without relief or without getting fresh air.

STANDING ORDERS

Because individuals differ, the leading Signalman runs his signal gang a bit differently from anyone else. Any good Signalman will carry out all orders received and will follow standard organization closely. There will be variations, however, in how dissimilar men go about accomplishing certain tasks. In addition to differences in personality of leading Signalmen, the distinct types of individuals comprising a signal gang have a bearing on the way the leading Signalman goes about his work.

The leading Signalman will want to put his way of doing things across to all of his men, and he will have to use the written (or standing) order. These orders contain his personal instructions on what he continually will require of his men. After issuing and explaining these orders to his gang, and obtaining their signatures acknowledging that they read and understand them, he then must hold all hands responsible for complying with provisions of the orders.

When a period of several months is involved, a written order obviously is more effective than a verbal order. It also is superior for the reason that, if a group of men is told collectively and verbally to do something, some men can easily misunderstand what they were told. A few of them will interpret what is said one way, whereas some will understand it another way. A written standing order eliminates doubt and confusion and leaves no excuse for failure to comply.

Although the leading Signalman does not want to start a paperwork empire, he does want to make sure that his men "get the word" on exactly what he requires of them. Thus, a good standing order is a must in his organization.

Standing orders for the organization, administration, and function of the signal gang and for the visual station must bear the approving signature of an officer, but it is the leading Signalman's definite responsibility to prepare these orders "in the rough" and submit them to his superior for approval.

Before writing standing orders, it is well to determine what directives already exist. Orders written by his predecessor should be reviewed by the leading SM before taking over. Any changes or comments should be discussed with his division officer.

Standing orders must be in agreement with the ship's organization book and the operations department organization book. Depending on the completeness of the latter book, it may not be necessary to prepare standing orders. (Some departmental organization books are merely a compilation of standing orders of various divisions in a department.) Standing orders could therefore be either a supplement to previously issued operations department organization orders or an actual part of that department's written organization.

Standing orders should be explained fully to the men, and a record of signatures should be kept to indicate that each member has read and understands these orders. They should be read and explained also when new men come on board. It would be a good idea to read some of the standing orders to the men every few months at morning quarters to refresh their memories.

Where practicable, standing orders should be posted so they will be visible to all of the gang. The leading Signalman should personally ensure that one copy each of the ship's organization book, ship's orders (and regulations), operations department organization book or standing orders, and the *Uniform Code of Military Justice* is available at all times in the living compartment. These books can be secured by a chain along with the watch, quarter, and station bill.

The leading Signalman should not make the mistake of having an excellently written organization and then fail to follow through. He should require that his orders be followed, and point out instances where failure to follow orders created problems. It is far better to have one good standing order that everyone adheres to than to have twenty that are ignored.

Remember that conditions change. The leading Signalman can develop good standing orders and have them obeyed, but they will lose their value if he fails to revise them continually as new situations arise. To assist him in preparing adequate standing orders, the accompanying sample should be useful. Note that it bears the number 4-72, which means that it is the 4th standing order for the year 1972.

USS SHIELDS (DD-596)
COMMUNICATION OFFICER'S ORDER NUMBER 4-72

From: Communication Officer

To: All Visual Communication Personnel

Subj: Duties of the Signal Supervisor

1. The signal supervisor during his watch must be in complete control of the signal personnel on watch and of the signal material in use. He must ensure that a proper lookout is kept by his watch at all times, taking care that his watch does not congregate. He must concern himself primarily with carrying on the signal activities and maintaining discipline; and secondarily, as necessary, with operating. He is responsible for seeing that instructions for the internal routing and filing of messages applicable to the signal section are complied with. During his watch he is required to:

a. Make sure that an alert watch is maintained at all times.

b. Coordinate and supervise the operations and activities of the watch in such a way as to maintain efficiency in handling visual traffic with a minimum of noise and confusion.

c. Be familiar with the *Allied Naval Signal Book, Visual Call Sign Book,* and all applicable instructions pertaining to visual communications.

d. Be thoroughly familiar with the *International Code of Signals* and the procedures for communicating with merchant ships.

e. Be familiar with combined and joint communication instructions and publications with respect to visual signaling.

f. Know the recognition and identification signals in effect, and be ready to reply instantly and to challenge when directed.

g. Be proficient in all forms of visual communications, including drafting messages for transmission in any visual system.

h. Keep himself and the watch informed of the disposition, organization, formation, and location of all units in company.

i. Know the responsibility of his ship for relaying and repeating visual signals and messages.

j. Be responsible for safeguarding all communication publications on the signal bridge.

k. Conduct effective training and instruction for the Signalmen on every watch, unless operating conditions positively prevent it.

l. Be responsible for the cleanliness and orderliness of the signal bridge and the personnel on watch.

m. Thoroughly familiarize himself and his watch with the location and use of emergency signal equipment, including Very pistols and pyrotechnics.

n. Acquaint himself and his watch with their duties in the various emergency bills, with particular emphasis on the man overboard bill.

2. The signal supervisor must be responsible for maintaining the visual signal log.

a. The visual signal log must contain a record of all signals from the *Allied Naval Signal Book* and/or other signal books, as sent or received, including the date, time of execution, originator, addressees, method by which signals are sent or received, and the signal itself but not its meaning. It also includes identification data on all other visual traffic and all noteworthy events that affect the visual watch, such as relieving the signal watch, exchange of calls, casualties to visual equipment, and the like. This record must remain on the signal bridge in custody of the signal supervisor, and must be signed by the supervisor upon being relieved of the watch. The visual log will be kept with a new page starting at the beginning of each radio day, using Greenwich mean time.

b. The method of transmission must be logged on all messages as follows:

Abbreviation	Meaning
FH	Flaghoist
FL	Small signal searchlight
SL	Large signal searchlight
BK	Yardarm blinker
SEM	Semaphore
NAN	Nancy

c. Any signal requiring action other than that demanded by the immediate tactical situation should be written up and handled as a regular message, with the additional logging of the signal in the visual log.

d. Messages and signals having a specified time of execution are given the same routing and handling as in the preceding step. (Includes message being written on message blanks.) A copy of all tactical messages goes to the OOD for his files; one copy is kept by the supervisor as a safeguard against loss; and remaining copies are sent to the communication center. The original, after it is initialed by the CWO, is returned to the visual file.

e. Emergency messages, including executive method, abbreviated plaindress, and high priority precedence messages, are accorded the normal routing to the communication center only after the signal force notifies the person(s) concerned.

Approved:	Submitted:
/s/ F. C. Collins, Jr.	/s/ J. W. Withers
F. C. COLLINS, Jr.	J. W. WITHERS
Lt, USN	LTJG, USN
Operations officer	Communication Officer

BATTLE BILL

Guides for shipboard organization are found in OPNAVINST 3120.32, *Shipboard Procedures* and NWIP 50.1, *Battle Control.* Organization for battle is the specific concern of the latter publication. Battle stations to be manned during various degrees of battle readiness are listed in a ship's battle bill. A complete list of the degrees of readiness follows.

First:	Complete readiness for immediate action.
Second:	Temporary relaxation from the first degree of readiness.
Third:	A part of the armament ready for immediate action, the remainder on short notice.
Fourth:	A part of the armament ready for immediate action, the remainder on prolonged notice.
Fifth:	Peacetime cruising, no armament manned.
Sixth:	No armament manned, ship in port under peacetime conditions.
Special:	Continuing readiness for limited action.

A particular degree of readiness may have variations (antiship, antisubmarine, radiological, etc.) to meet pending threats with maximum effectiveness.

The basis for organization of a ship is the manning requirement for battle. An individual's capability to perform the duties required in battle is the main consideration of his assignment within the ship. Whenever possible, however, a division of men is assigned as a unit in the battle organization.

Manning requirements of installed equipment, particularly weapons, fix the number of assigned shipboard personnel. The Office of the Chief of Naval Operations determines the total number of men and officers needed to accomplish the wartime objectives of a ship. Based on this determination, the Bureau of Naval Personnel prepares both a wartime complement (i.e., the actual number of persons required to man all battle stations) and a peacetime allowance by officer grades and enlisted rates. The allowance, usually expressed as a percentage of the complement, is based on the number of persons needed to operate the ship in peacetime.

The complement and allowance are furnished to the type commander and the ship. The type commander then prepares a ship's organization and regulations manual, which contains a standard battle bill for ships of the type. Individual commanding officers may modify the battle bill and the organization book only to the extent necessitated by manpower limitations, variations in installed equipment, and so on.

In the battle bill, each station and duty are assigned to an enlisted man by billet number, as in figure 2-1. A billet number is composed of a series of numerals or a combination of numerals and letters indicating a man's division, and his seniority within the section. Billet number OS-101, to illustrate, signifies that a man is in the communication division, in the first section, and senior man in the section. The reason for the need to show seniority, or precedence, is because the chain of command must be adhered to rigidly within the battle organization. Except in an emergency, each station normally reports only to the station of the immediate superior. Senior personnel in communication control, for example, report to operations control, which, in turn, reports to command control. The line of communications and the chain of command are identical.

WATCH, QUARTER, AND STATION BILL

After assigning personnel in his division to all duties and stations specified in the battle bill and ship's bills, the leading Signalman notifies his men by posting a detailed summary of those assignments in the watch, quarter, and station (WQS) bill.

The watch, quarter, and station bill is of primary importance to the leading Signalman, to the division officer, and to the division itself, because it is the controlling factor in specifying who does what, and where, in all shipboard evolutions from special sea detail to general quarters.

Ordinarily the leading Signalman is responsible for preparing the watch, quarter, and station bill for personnel assigned to the visual communication gang. Assignments on the WQS bill must reflect the closest cooperation and agreement between the leading Signalman and his division officer, who is answerable to the operations

ENLISTED ASSIGNMENTS TO BATTLE STATIONS								
	Complement				Allowance			
Station and duty	Cond. I	Cond. III			Cond. I	Cond. III		
Ship control								
(1) Bridge								
Talker (JX)	OS-204	-	-	-	OS-204	-	-	-
(2) Signal bridge								
Signal supv.	OS-101	-	-	-	OS-101	-	-	-
Port flagbag	OS-201	OS-104	OS-201	OS-303	OS-201	OS-104	OS-201	OS-303
Stbd. Flagbag	OS-303	1-108	1-209	OS-306	OS-303	1-108	1-209	OS-306
Operator	OS-104	1-109	2-209	2-309	OS-104	1-109	2-209	2-309
Recorder	OS-105	OS-105	1-210	1-310	OS-105	OS-105	1-210	1-310
Messenger	OS-107	OS-107	2-210	2-307	OS-107	2-110	2-210	2-307
(3) Lifeboat								
And so on								

24.12

Figure 2-1.—Battle bill.

officer, executive officer, and the Captain for effective use of the men.

In assigning any man to duty in the division, personal knowledge of the individual is a must, as well as knowledge of his capabilities in all shipboard duties he may be required to carry out. This knowledge of a man and his capabilities is sometimes rather difficult to acquire. It is for this reason that the leading Signalman should consult his division officer regarding assignments of men to their billets. Both leaders have had ample opportunity to observe the men under their supervision, and should make the proper choice in placing the right man in the right billet.

Another consideration in making out the WQS bill is the complexity encountered in understanding the total range of duties for which Signalmen are responsible in different ship evolutions, particularly in large ships. Moreover, the leading Signalman practically has to know what the future holds. This long-range foresight includes giving careful thought to possible reenlistments, acquisition of new men, and future operations of a ship.

Regardless of the type of ship one may be on, the ship's organization book contains the following bills: administrative bills: personnel assignment bill, berthing and locker bill, cleaning and maintenance bill; operational bills: special sea detail bill, replenishment at sea bill, rescue and assistance bill, landing party bill, visit and search, prize crew, and boarding and capture bill; emergency bills: general emergency bills, fire bill, man overboard bill. In addition to the foregoing bills, other ships will have particular bills to govern their activities. The leading Signalman must understand the contributions made to all of them by Signalmen.

When the watch, quarter, and station bill is made out properly, promulgated, and kept up to date, with proper training, every man should be able to perform all duties required of him at each assigned station.

A good test for training and organization of the signal gang is the sea detail. All eyes from other ships and shore facilities will be on them. With all the men on the bridge, it is up to the leading Signalman to ascertain that they man their stations promptly when the word is passed. Their uniforms must be correct and clean. All hands must remain alert, answer calls quickly, hoist signals, and promptly relay information to those who need to know.

The Navy trains for weeks, months, and years to prepare for battles that may be won or lost in minutes. Here is where ability to train and organize a signal gang gets its supreme test. Naturally, a ship cannot avoid battle action because some men don't know their duties at their battle stations. It cannot be known ahead of time that all men will be able to man their stations, or if some key men will be injured. All contingencies that may arise must be considered before entering any area where battle action may be expected.

It is the responsibility of the leading Signalman to make sure that the gang can perform the duties prescribed. Personnel must be ready to shift in any station where a vacancy may appear—an impossible task unless the training program is designed to train all men in all duties the division is expected to perform.

TRAINING DUTIES

A prime requisite for going into battle is preparedness, and one essential ingredient of preparedness is training. The objective of training is to increase the ability of personnel to operate material and equipment effectively under any foreseeable condition. Your role and responsibilities in training increase as you advance in rating from, perhaps, the simple show-and-tell stage at the third class petty officer level to preparing a departmental long-range training program and observing and evaluating departmental exercises.

SELF-TRAINING

Although training, at the higher petty officer levels, is often thought of as the instruction and supervision of lower-rated men, you must not neglect the responsibility of keeping yourself up-to-date and in a state of readiness. This responsibility can be met only by repeated review of applicable publications, study of publications changes, and practice in actual signaling. Methods, procedures, and equipments change as technology advances, and part of your self-training should be directed toward changing with the system. If you have not read the most recent governing materials, it is unlikely that you can teach current, correct procedures. It is equally improbable that you will attain the required signaling speeds for the first class level without practice. Current requirements for Signalmen advancing to pay grade E-6 are to transmit and receive coded groups by flashing light at a rate of 10 words per minute, and to transmit and receive plain language by flashing light at a rate of 12 words per minute. Current semaphore requirements are to transmit and receive plain language at a rate of 20 words per minute.

In addition to your study of publications in current use, you should avail yourself of every opportunity to gain a thorough knowledge of reserve-on-board publications. (Reserve-on-board publications are classified publications held by the command, but they are not effective until made so by proper authority.) From these publications you may learn methods for drafting messages, recognition signals, etc., under simulated or actual wartime conditions. Specific details concerning the use of reserve-on-board publications are classified, thus they are not elaborated on here. Your communication officer or RPS custodian aboard ship can provide you with access to these publications or with necessary information contained therein.

TRAINING PLAN

The remainder of this chapter deals with the training of lower-rated personnel and other personnel who may be assigned to visual signaling duties. At this time it might be advisable for you to review the materials on training in the military requirements manuals for *PO 3&2* and *PO 1&C*. You should give particular attention to those sections covering the type(s) of instruction to use to best put across the type of subject matter being presented.

Your most reliable source of information on instruction is probably the *Manual for Navy Instructors*, NAVPERS 16013. Complete details on preparing lesson plans and job analyses, and presentation of lessons are contained in that publication. Here, we will limit ourselves primarily to discussions of what should be taught and secondarily to methods to be employed.

Much information is taught through on-the-job training, i.e., permitting the trainee to participate in the actual work performed, and developing his ideas through experience. For any other type of instruction (lecture, discussion, demonstration, or any combination of these three) a schedule should be established. This schedule should encompass as many areas of visual communications as possible and should coincide with the ship's military training schedule.

As prescribed in *Shipboard Procedures*, OPNAVINST 3120.32, the planning board for training (composed of the executive officer, department heads, educational services officer, and the appointed training officer) assists the commanding officer in formulating training policies. This board also establishes the training program for the ship and periodically reviews the schedules within the program to evaluate the progress of training and future requirements.

SCHEDULING LECTURES AND DRILLS

After the planning board for training outlines the requirements, the training officer prepares and maintains long-range and short-range training schedules and promulgates a weekly training schedule. From the weekly training schedule, you can determine the amount of time available specifically for training. At this point you should decide what type of instruction is best suited to the material to be covered during the instruction period. Valuable information designed to help you make this determination is contained in *Military Requirements for PO 1&C.*

ENSURING ATTENDANCE BY ASSIGNED PERSONNEL

Although some of your men will be eager to attend every lecture, drill, or training session available to them, other personnel will be equally anxious to avoid anything that remotely resembles school. When dealing with a small group of men you will be able to distinguish quickly between the go-getters and the slackers. If, however, many men are involved, or if periods of instruction are conducted by different petty officers, a system of rollcall or muster must be devised that will indicate who was present during instruction and who was not. If a General Record (Type II), OpNav form 1500-31 is used, each man's name can be listed along the side of the form and the title or number of the lesson across the top. As lessons are presented, the date can be entered in the block at the intersection of the name row and the lesson column. By this method, attendance at any lesson on any date can be determined by inspection.

Personnel who are habitually unexcused absentees from training sessions usually have (they say) good reasons. These "good" reasons are not necessarily the "real" reasons. As senior man, it behooves you to determine the actual reasons for absenteeism, and take remedial action. In rare instances disciplinary action may be warranted, but normally, proper counseling will solve such problems. Motivation–instilling the desire to learn–is almost always more effective than punishment. Personnel can usually reach the proper degree of motivation if they are shown the advantages and rewards of learning as it affects their chances for advancement, their opportunity for assignment to positions of greater responsibility and authority, and the pattern of their entire naval career.

Provisions of BuPers notices dealing with the rate and function of Senior and Master Chief Petty Officers charge those two rates with broad responsibility for instruction and training of lower-rated men. The *Manual of Qualifications for Advancement*, NAVPERS 18068-B delineates particular subjects in which instruction should be given. Ensuing topics deal with these subjects.

IDENTIFICATION OF AIRCRAFT

Instruction in identification of aircraft should consist primarily of classroom lectures, slides, and motion pictures, together with on-the-job instruction when aircraft are operating in the ship's vicinity.

The different types of aircraft presently in use by military and naval powers are so numerous that only a true expert can be expected to know and recognize them all. The myriad of bombers, fighters, fighter-bombers, and reconnaissance planes may be propeller-driven or jet, single-engine or multi-engine, straight-wing, delta-wing, swept-wing, or combinations of these and various other descriptions.

With each advance in aeronautical engineering and design, aircraft are able to fly higher and faster. High-speed characteristics tend to make aircraft of different nationalities look very much alike, thus increasing the difficulty of in-flight identification. For the foregoing reasons, shipboard recognition training should stress ability to recognize aircraft likely to be encountered in a local area of deployment rather than worldwide (Determination of the friendly (or unfriendly) character of aircraft is a prime function of the ship's installed IFF system, which can be used to interrogate aircraft long before the craft are within visual range.) Exact names and designations may prove unimportant, but personnel should be taught to distinguish between the various classes of aircraft–bombers, fighters, reconnaissance, transport, pilotless, etc.

IDENTIFICATION OF SHIPS

Ship identification requires the same types of instruction (classroom and on-the-job) as aircraft identification. It may be possible, here, to place more emphasis on on-the-job training because wide variations in ship types are encountered in normal operations on the high seas

Recognition of ships at sea is of as much importance as the recognition of airborne aircraft. Inasmuch as surface vessels travel in only two dimensions and at much slower speeds than aircraft, they are easier to identify visually. Ships normally should be identified while they still are distant enough to present only a silhouette to the observer. The types/classes of ships can be determined from their silhouettes long before their hull numbers or names can be distinguished. The first determination to be made is whether a vessel is a merchant (civil) or naval ship.

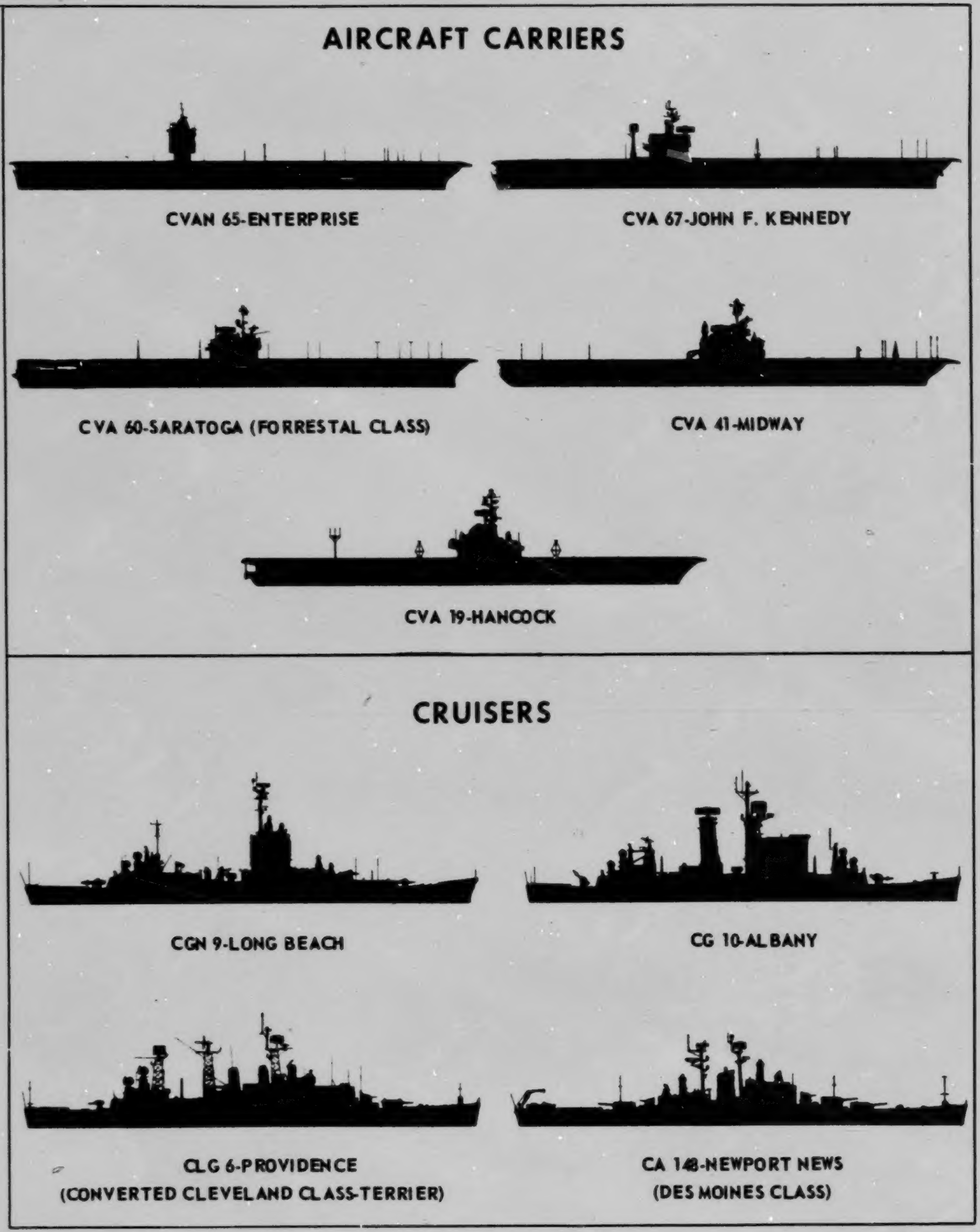
In general, merchant vessels appear bulkier than Navy ships. They lack the flowing lines of Navy ships and usually have more deckhouse and superstructure. When close enough for colors to be distinguishable, merchant vessels can be recognized easily because they are painted in a variety of colors. Virtually all maritime powers paint their naval ships some shade of gray or blue-gray that blends easily with a sky or ocean background. During peacetime, another indication of the merchant/naval character of a vessel is the presence of visible weapons. The absence of guns may have little significance, but their presence almost certainly indicates a naval vessel.

As with aircraft, the friendly character of a naval ship may be determined by use of IFF. (In some instances the complete identity of a ship may be ascertained in this manner.)

Figure 2-2 shows approximations of the silhouettes of a number of U.S. Navy ship types. Foreign ships naturally have different class names and designations from U.S. Navy ships, but ships that engage in similar work must necessarily be somewhat alike in design. Examples: carriers must have flight decks; guided missile ships must have launching platforms or other launching equipment; and communication ships have a large array of antennas.

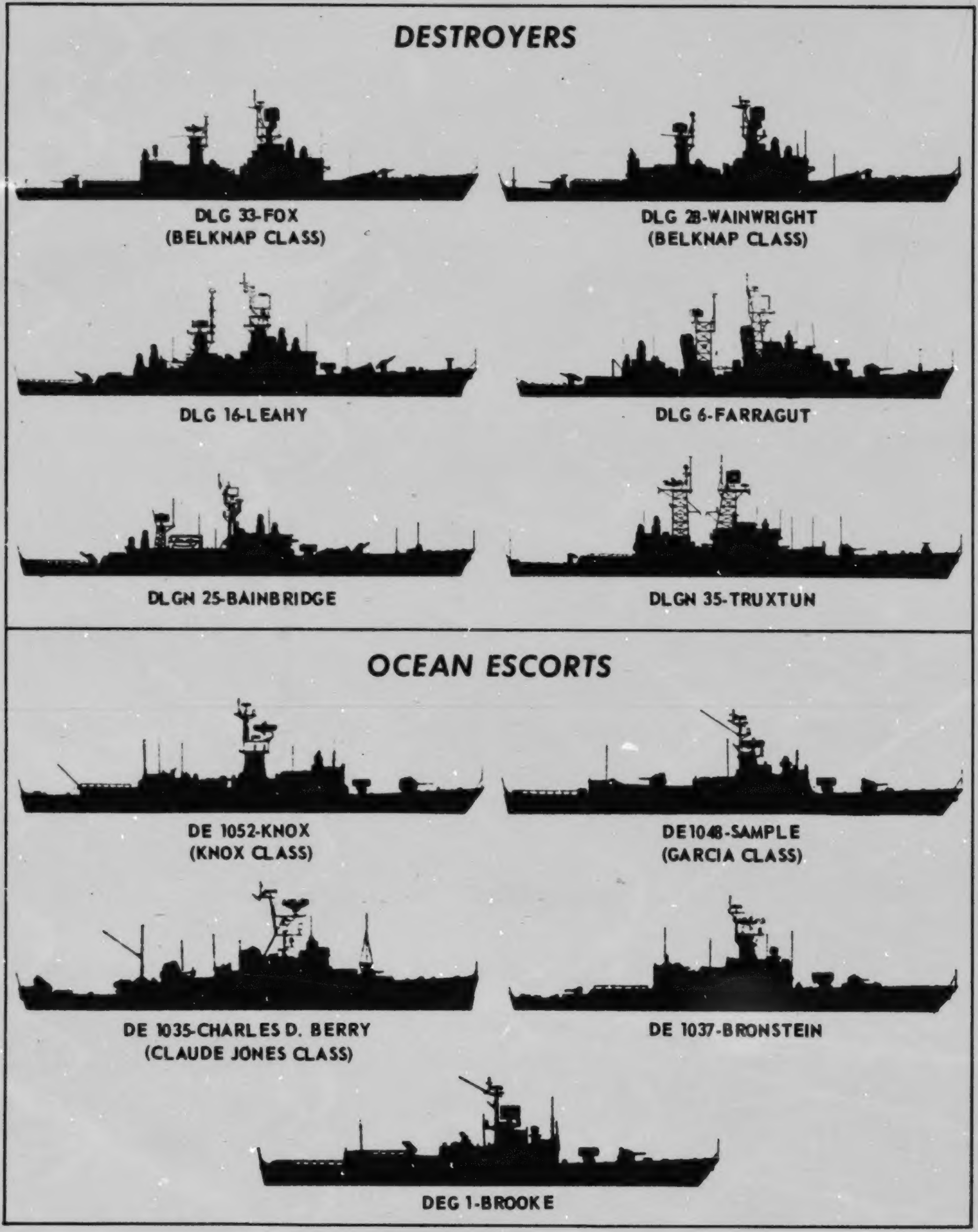
Soviet Naval Operations are increasing throughout the world. With the rising number of Soviet vessel sightings, the need for rapid and accurate identification is paramount. Figure 2-3 shows the approximate silhouettes of the most commonly sighted Soviet warships. To help you translate Russian ships names, figure 2-4 shows a transliteration table to convert the Russian alphabet into the English alphabet.

Various publications for use in ship identification may be available aboard ship. These publications include *Jane's Fighting Ships, Submarine Recognition Manual,* NAVPERS 10011, and several Naval Intelligence Command (formerly ONI) manuals. When these publications are not retained on the signal bridge, they usually are in the custody of the operations officer or intelligence officer.



37.36.1(37C)

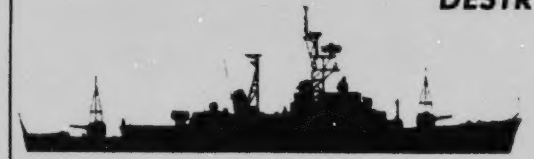
Figure 2-2.—Silhouettes of U.S. Navy Ship types.



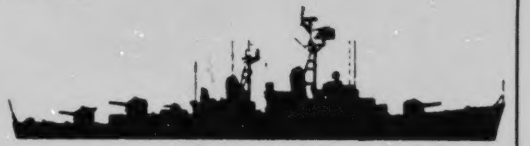
37.36.2(37C)

Figure 2-2.—Silhouettes of U.S. Navy Ship types—Continued.

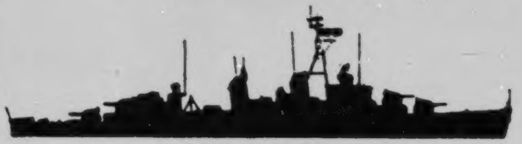
DESTROYERS



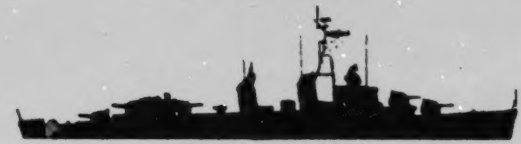
DD 938-JONAS INGRAM
(FORREST SHERMAN CLASS-ASW)



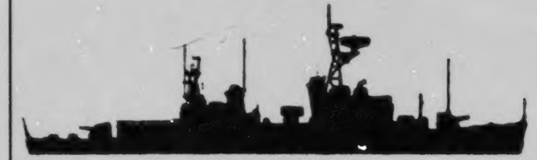
DD 940-MANLEY
(FORREST SHERMAN CLASS)



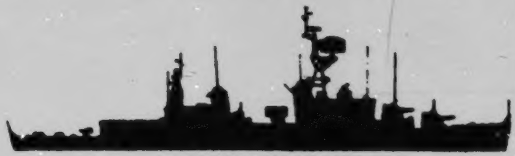
DD 630-BRAINE
(FLETCHER CLASS)



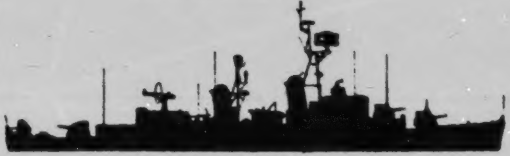
DD 596-SHIELDS
(FLETCHER CLASS-5 GUNS)



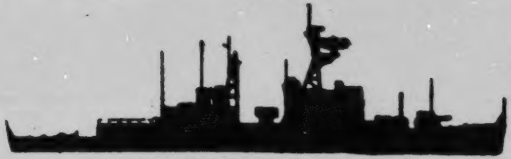
DD 842-BASILONE
(GEARING CLASS FRAM 1)



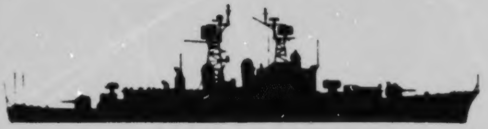
DD 890-MEREDITH
(GEARING CLASS FAM 1)



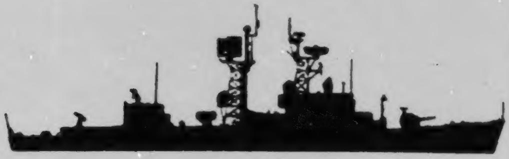
DD 831-GOODRICH
(GEARING-CLASS RADAR PICKETS)



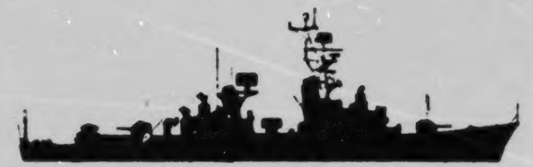
DD 827-ROBERT A. OWENS
(CARPENTER TYPE FRAM 1)



DDG 35-MITSCHER



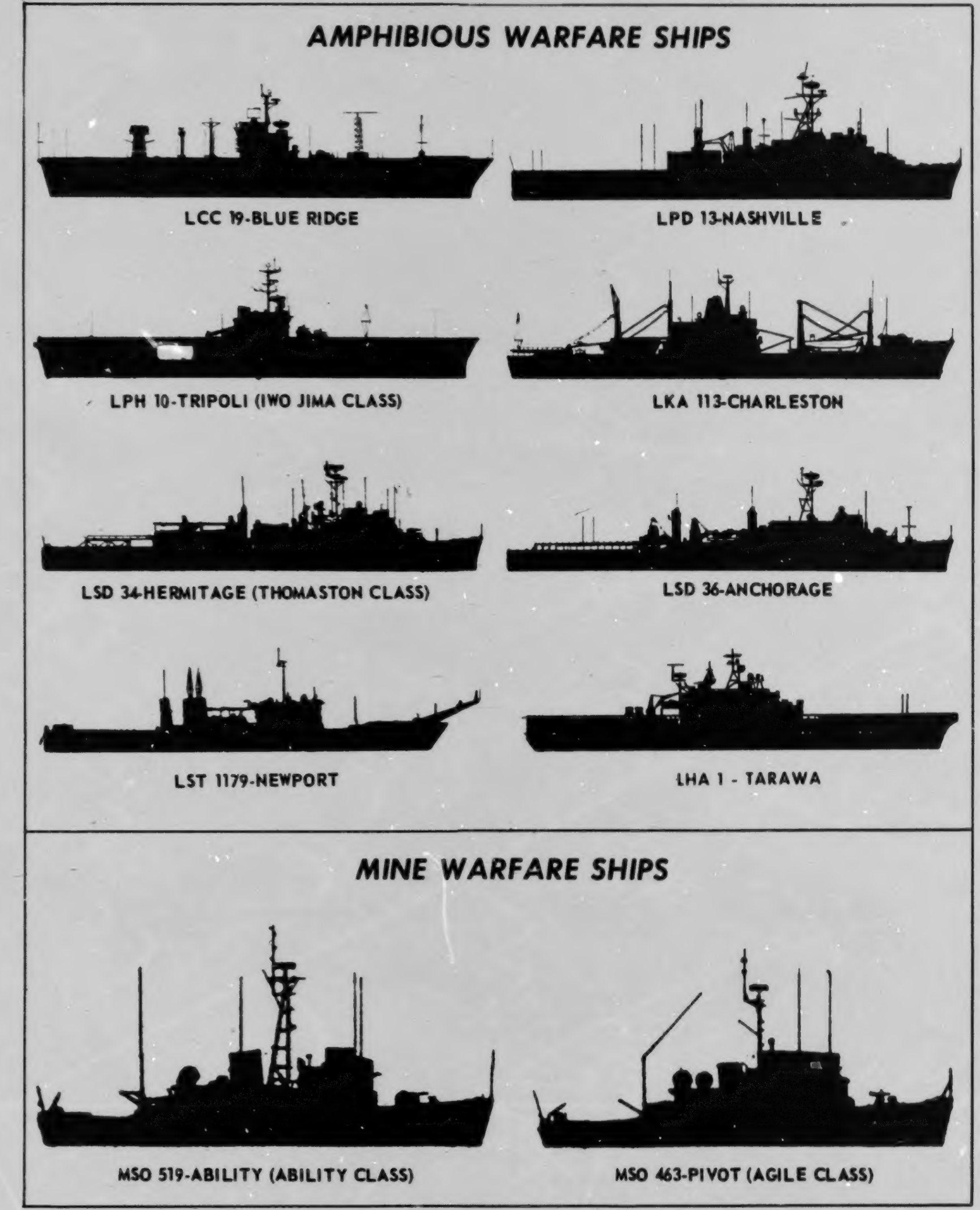
DDG 34-SOMERS
(COVERTED FORREST SHERMAN CLASS)



DDG 6-BARNEY
(CHARLES F. ADAMS CLASS)

37.38.3(37C)

Figure 2-2.–Silhouettes of U.S. Navy Ship types–Continued.



AMPHIBIOUS WARFARE SHIPS

LCC 19-BLUE RIDGE

LPD 13-NASHVILLE

LPH 10-TRIPOLI (IWO JIMA CLASS)

LKA 113-CHARLESTON

LSD 34-HERMITAGE (THOMASTON CLASS)

LSD 36-ANCHORAGE

LST 1179-NEWPORT

LHA 1 - TARAWA

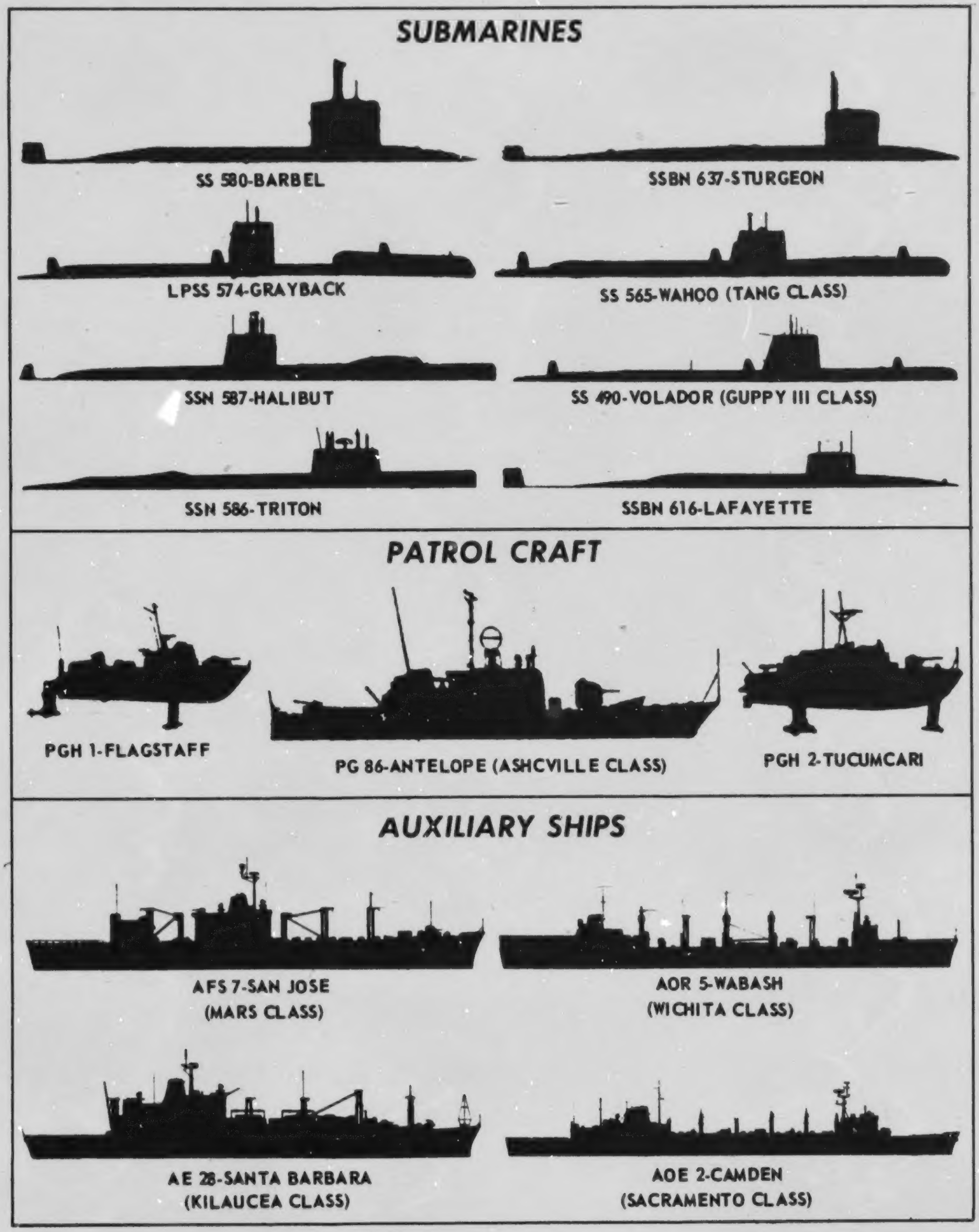
MINE WARFARE SHIPS

MSO 519-ABILITY (ABILITY CLASS)

MSO 463-PIVOT (AGILE CLASS)

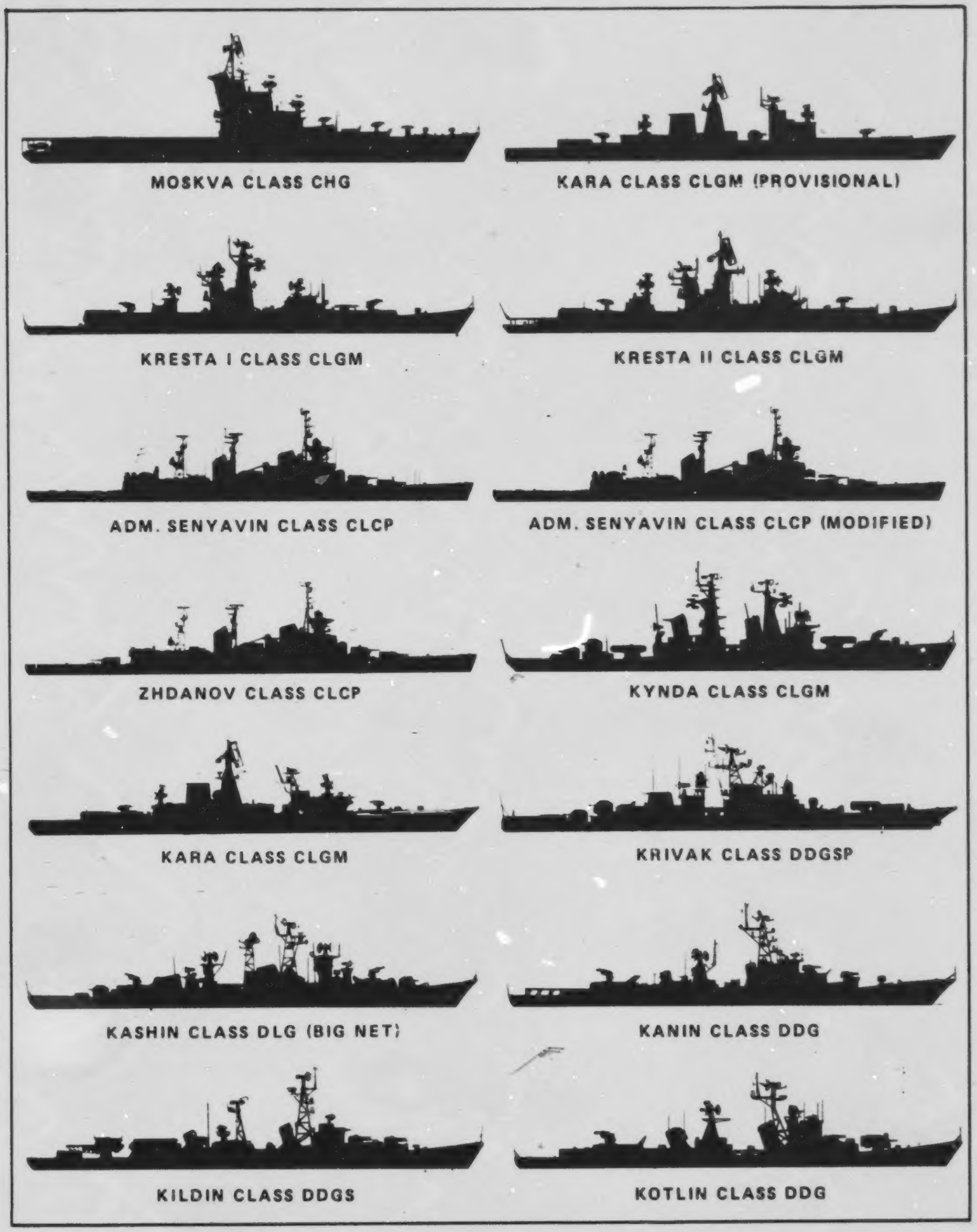
37.36.4(37C)

Figure 2-2.—Silhouettes of U.S. Navy Ship types—Continued.



37.36.5(37C)

Figure 2-2.—Silhouettes of U.S. Navy Ship types—Continued.



MOSKVA CLASS CHG

KARA CLASS CLGM (PROVISIONAL)

KRESTA I CLASS CLGM

KRESTA II CLASS CLGM

ADM. SENYAVIN CLASS CLCP

ADM. SENYAVIN CLASS CLCP (MODIFIED)

ZHDANOV CLASS CLCP

KYNDA CLASS CLGM

KARA CLASS CLGM

KRIVAK CLASS DDGSP

KASHIN CLASS DLG (BIG NET)

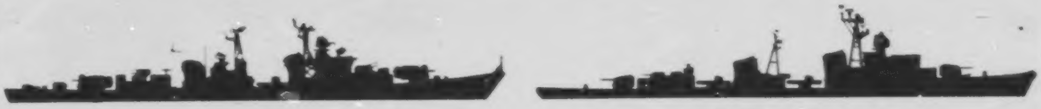
KANIN CLASS DDG

KILDIN CLASS DDGS

KOTLIN CLASS DDG

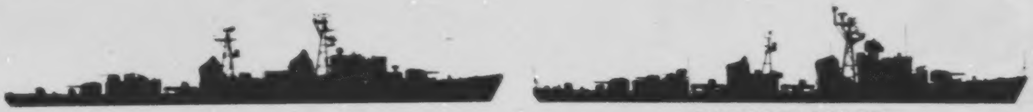
37.51.1

Figure 2-3.—Silhouettes of most commonly sighted soviet warships.



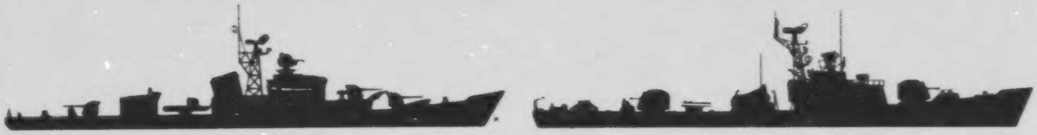
KOTLIN CLASS DD (MODIFIED)

SKORY CLASS DD



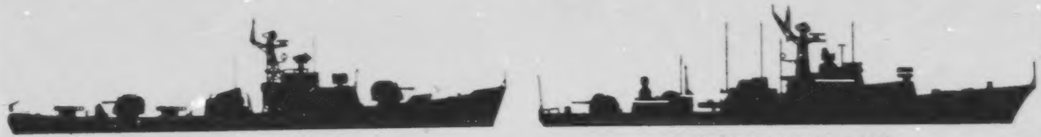
SKORYY CLASS DD

SKORYY CLASS DD



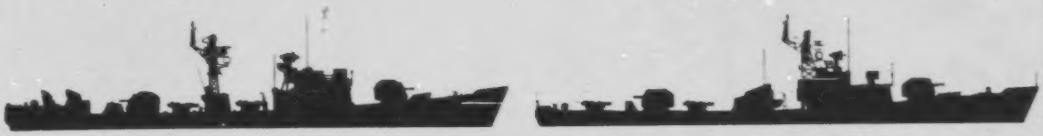
RIGA CLASS DE

PETYA I CLASS DE



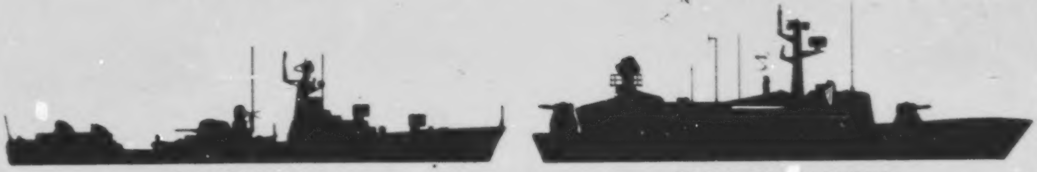
PETYA II CLASS DE

GRISHA CLASS PCEP



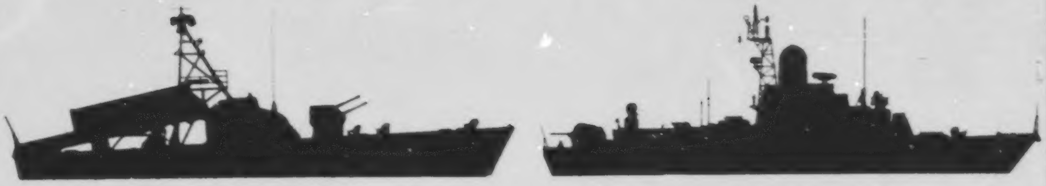
MIRKA II CLASS DE

PETYA II CLASS PCE



POTI CLASS PCE

OSA II CLASS PETFG

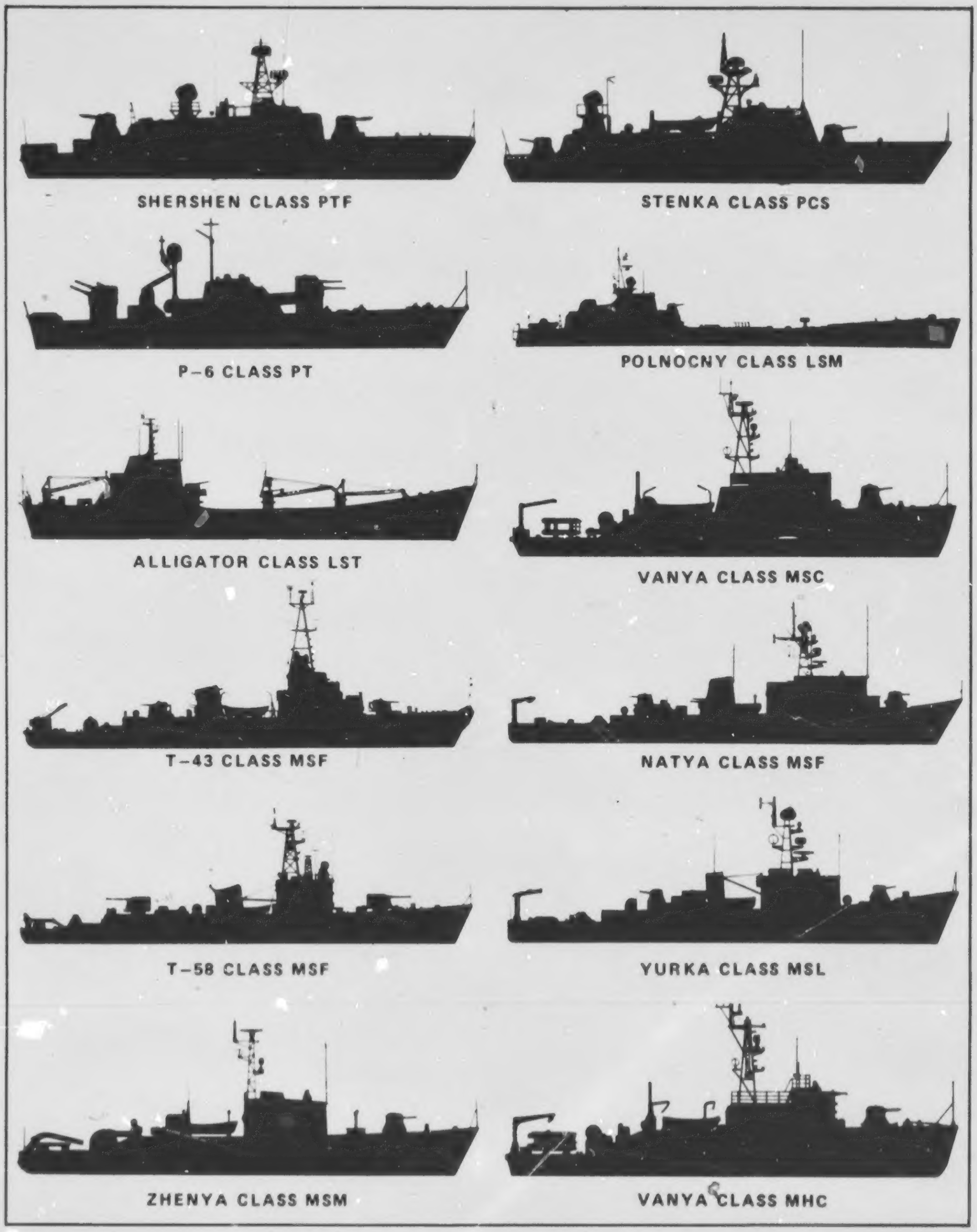


KOMAR CLASS PTG

NANUCHKA CLASS PGGP

37.51.2

Figure 2-3.—Silhouettes of most commonly sighted soviet warships—Continued.



SHERSHEN CLASS PTF

STENKA CLASS PCS

P–6 CLASS PT

POLNOCNY CLASS LSM

ALLIGATOR CLASS LST

VANYA CLASS MSC

T–43 CLASS MSF

NATYA CLASS MSF

T–58 CLASS MSF

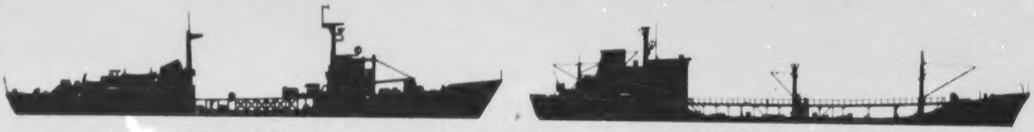
YURKA CLASS MSL

ZHENYA CLASS MSM

VANYA CLASS MHC

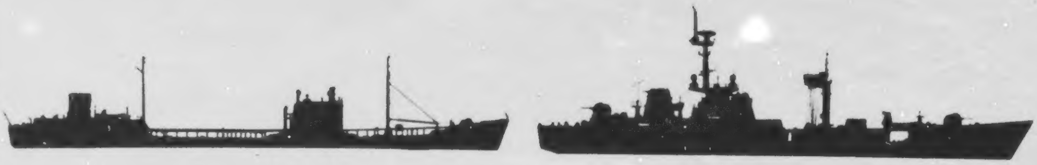
37.51.3

Figure 2-3.—Silhouettes of most commonly sighted soviet warships—Continued.



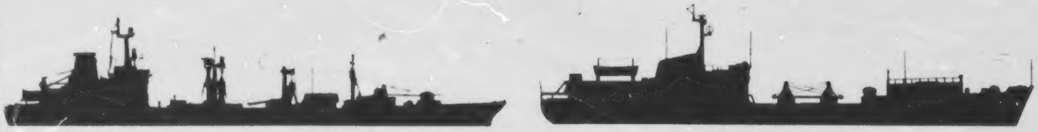
UDA CLASS AO

ALATAY CLASS AO



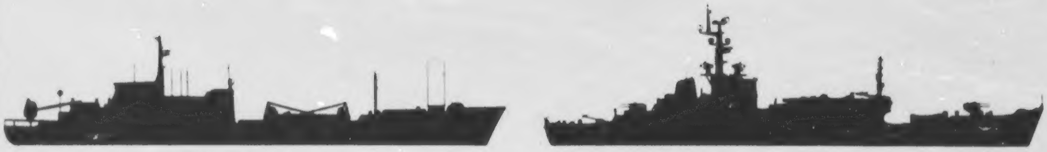
VODCHOV CLASS AO

MANYCH CLASS AO



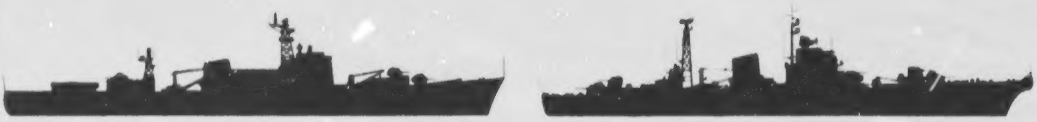
CHILIKIN CLASS AOR

OSKAL CLASS AR



AMUR CLASS AR

LAMA CLASS AEM

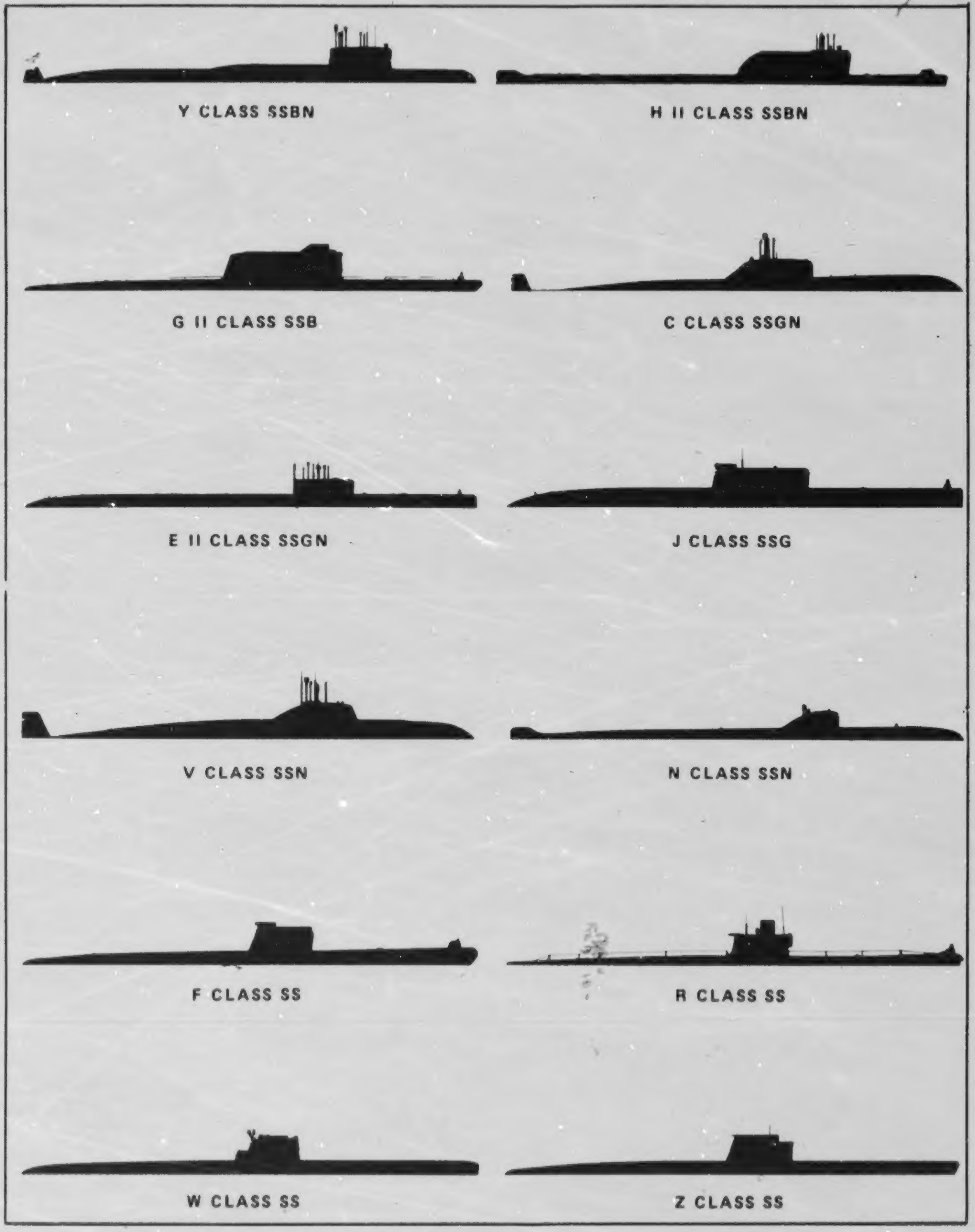


UGRA CLASS AS

DON CLASS AS

37.51.4

Figure 2-3.—Silhouettes of most commonly sighted soviet warships—Continued.



37.51.5

Figure 2-3.—Silhouettes of most commonly sighted soviet warships—Continued.

CAPITAL LOWER CASE	ENGLISH TRANSLITERATION	PRONOUNCED	CAPITAL LOWER CASE	ENGLISH TRANSLITERATION	PRONOUNCED	CAPTIAL LOWER CASE	ENGLISH TRANSLITERATION	PRONOUNCED
А а	A	like *a* in father	Л л	L	like *l* in well	Ц ц	TS	like *ts* in mats
Б б	B	like *b* in bell	М м	M	like *m* in stem	Ч ч	CH	like *ch* in check
В в	V	like *v* in vent	Н н	N	like *n* in pen	Ш ш	SH	like *sh* in shine
Г г	G	like *g* in get	О о	O	like *o* in more	Щ щ	SHCH	like *sh-ch* fresh cheeks
Д д	D	like *d* in debt	П п	P	like *p* in pet			
Е е	E	like *e* in debt or yet	Р р	R	like *r* in error	Ы ы	Y	like *i* in hit
			С с	S	like *ss* in mess	Ь ь	(none)	(none) (soft sign)
Ж ж	ZH	like *s* in measure	Т т	T	like *t* in tell	Э э	E	like *e* in bet
З з	Z	like *z* in lazy	У у	U	like *oo* in boot	Ю ю	YU	like *u* in mute
И и	I	like *ee* in meet	Ф ф	F	like *f* in effect	Я я	YA	like *ya* in yard
Й й	Y	like *y* in boy	Х х	KH	like *ch* in Scottish word *loch*			
К к	K	like *c* in calf						

37.52

Figure 2-4.–Transliteration table of the Russian alphabet.

RECOGNITION AND IDENTIFICATION PROCEDURES

Recognition and identification procedures can best be taught through classroom instruction, reenforced by actual practice with flashing light, and through drills with other ships.

Recognition and identification procedures, as used in this topic, deal with the determination of a ship's or station's friendly character by means of visual signals. The terms "challenge and reply" or "challenge and identity" most frequently indicate this procedure. Appropriate definitions follow.

Recognition: Determination, by any means, of the friendly or enemy character, or of the individuality of another.

Identification: Indication, by act or means, of your own friendly character or individuality.

Challenge: Process carried out by one unit or person with the objective of ascertaining the friendly or hostile character, or identity of another.

Reply: Answer to a challenge.

Inexperienced Signalmen frequently have the erroneous impression that the unknown station call ($\overline{\text{AA}}$) constitutes a challenge. This call asks, at most, for the receiving ship's call sign; it is never used in a challenge.

The correct signals for challenge and identity are given in the effective edition of *Recognition and Identification Instructions–Air, Land, and Sea Forces* (ACP 150). This publication is Confidential, therefore specific details concerning its content are not given here. It is carried aboard all U.S. Naval ships, however, and should be studied thoroughly. Broad information concerning challenge and identity is given in the following listing.

- Actual signals to be used in the challenge and reply are generated from highly classified key lists, accessible to a limited number of personnel on each ship, and are effective for a relatively short period of time. The method of generating signals is never divulged to unauthorized personnel.

- During their effective periods, challenges and replies delivered to the signal bridge for use have a lower security classification than do the key lists from which they are taken. Effective signals must, nevertheless, be afforded protection commensurate with the security classification assigned. All such signals must be destroyed by burning when their effective periods expire.
- During hostilities, challenges must be made only when the ship is ready for battle, and only at the direction of the commanding officer. Only he may decide whether the reply received from a challenged vessel is correct.
- Challenges normally are sent twice, at a rate not to exceed eight words per minute, using a bright directional light, accurately aimed to ensure reception by the challenged ship. No assumptions should be made concerning the use of binoculars or other visual aids aboard the challenged vessel.
- Inasmuch as the reply to a challenge must be made immediately to preclude the challenging ship's opening fire, in an emergency transmission of the reply may be authorized by the officer of the deck.
- Challenge and identity signals differ, depending on whether the ships involved are of high security status, low security status, or merchant vessels. A special challenge exists for use in situations wherein the status of the ship to be challenged cannot be determined by observation.

VISUAL PROCEDURES AND DOCTRINE

Visual communication procedures and doctrine exist only to assist the Signalman in the performance of his duties. Procedures and doctrine can be taught through on-the-job training, but that method usually has an unsatisfactory material-learned/man-hours-expended ratio because procedures can be learned only as different situations arise. Classroom instruction and drills are much less expensive in terms of man-hours expended and results achieved, because methods, procedures, safety precautions, etc., can be taught in order of importance or in some logical order that will aid the trainee in committing them to memory.

Complete information on message forms, the schematic diagram, operating signals and prosigns, visual responsibility, flashing light, semaphore, flaghoist, and infrared should be included in your training program. The priority that you give to each subject may be dictated by circumstances. If you have a well-established training program and personnel with some degree of experience, continuation of the program in its planned sequence is probably the best course of action. By so doing, you ensure the widest possible degree of coverage of the program during the ship's regular training cycle. If, on the other hand, you have a group of inexperienced men, are setting up a new training program, or have scheduled visual signaling operations with which your men are unfamiliar, you will find it profitable to alter your training program, emphasizing those subjects of immediate importance and ignoring (for the time being) those portions that are less urgent.

GRADED EXERCISES

Drills and exercises constitute a large part of the communication department's training program. Noncompetitive exercises and emergency drills are performed within the ship for purposes of acquainting personnel with correct procedures, and increasing the efficiency of personnel in areas with which they are familiar. Competitive (graded) exercises are performed when assigned by the type commander or other competent authority. Results of these exercises are used to keep the type commander informed of the readiness state of individual units. Maximum benefit is derived when an exercise is observed and analyzed. Umpires and various assistants—assigned by the officer scheduling the exercise (OSE)—make the observations and analyses.

Ship Exercises (FXP 3) lists several exercises that are either designed specifically for some phase of visual communication, or have visual communications as an element of the overall exercise. These exercises include Flaghoist, Z-20-C; Flashing Light/Nancy, Z-21-C; Semaphore, Z-22-C; Challenge and Reply, Z-23-C; and Communications Operational Planning, Z-40-C. Each of the exercises has its own system of grading. You should be aware of these systems in order to detect discrepancies when observing an exercise, and to avoid errors, with consequent loss of points, when being graded. Observation of personnel during an exercise is one of the principal methods of determining areas in which specialized or more intensive training should be undertaken.

Examples of visual communication exercises are shown in Fig. 2-5.

CRITIQUES

A critique is a critical review of an exercise, held in the form of a conference. All graded exercises should terminate with a critique, attended by the umpire, his assistants, and key personnel of the unit being graded. You should become as familiar as possible with critiques so that you can best present appraisals of exercises that you observe, or can derive maximum benefit from critiques that you attend as a member of the exercise ship.

During the conduct of exercises, observers keep a chronological record of events taking place, or they make notes concerning procedural errors or other discrepancies, handling times, outstanding performances, equipment failures and repairs, and other occurrences that may have a bearing on the outcome of the exercise.

As part of the critique, the important aspects of each observer's notes are presented. The following points concerning the exercise are covered:

- Manner of its performance.
- Errors committed.
- Deficiencies of material or procedure.
- Recommendations for improvements of material and personnel performances.

The last point—recommendations for improvements—may be more important than any other item because improvement is the goal of all training. Recommendations may be limited to minor changes in procedures, or to training in a particular area. Conversely, they may encompass overhaul of entire systems, and addition or replacement of equipment.

Tentative grades may be assigned at critiques. Final appraisals, however, are the responsibility of the type commander, who is able to compare the performance of one unit with another. He also strives for uniformity of grading within the type.

VISUAL COMMUNICATIONS (Z-20-C through Z-23-C)

These exercises may be used for day-to-day training and evaluations or as the criteria for Operational Readiness Inspections (ORI). For all exercises, preparation and execution must be oriented toward their primary purpose of training. There is no provision for an exercise to evaluate overall communications. It is intended that various communications exercises from FXP 3 will be performed in combination to test all installed systems and functions. The designation of these exercises will be the function of operational or type commanders. During periods of EMCON, visual signaling may be the only method of communications available. Therefore, it is imperative that proficiency in visual communication be maintained. This series of exercises (Z-20-C through Z-23-C) is designed to train and evaluate personnel in visual signaling procedures.

Communications Evaluation

The exercises may be used individually or in combinations for the following evaluation requirements; training, Operational Readiness Inspection (ORI), Pre-deployment COMM/ELEX inspection, Overall communications exercise.

The OCE will promulgate the following information:

1. Where: Ship's name, location (in port/underway)
2. When: Starting time and duration of exercise(s)
3. Which: What exercises and for which installed system(s)
4. Who: The senior observer

Any additional comments required will be promulgated so that the exercise unit will be fully prepared.

Grading

The weight assigned for each evaluation factor is the norm. The senior observer may deduct

FLAGHOIST SIGNALING PROCEDURES Z-20-C

PURPOSE

Train and evaluate the tactical communications team in flaghoist signaling procedures and proficiency in the use of ATP 1(A) Vol II, ACP 131, ACP 118, and HO 102.

REQUIREMENTS

Demonstrate the ability to encode and decode flaghoist signals using ATP 1(A) Vol II, ACP 131, and HO 102 and the proper use of all related procedures.

PROCEDURES

OCE

Designate or assign:

Exercise ship.

Assist ship.

Exercise observer(s).

Starting time and duration of the exercise.

Number of signals to be transmitted and received.

ASSIST SHIP OR ASSIST STATION

As directed by the OCE, provide the following services:

Transmit a minimum of 15 flaghoist signals, including one incorrect signal.

Test speed and reliability of spotter and personnel manning the flagbag.

Encode visual call signs to test personnel in the use of visual call signs ACP 118.

EXERCISE OBSERVER

Observe and evaluate the exercise.

Require the tactical communicator to encode five plain language messages which are then to be delivered to signal supervisor for hoisting.

Critique exercise personnel upon completion of the exercise.

EXERCISE SHIP

Signalmen and tactical communications man condition #1 (GQ) stations.

Maintain a complete log of all exercise traffic for submission to the exercise observer(s).

Furnish observer with a written decode of all signals.

EVALUATION

	Weight	Yes	No
1. Personal knowledge (10 points) Did signalmen, tactical communicator, CIC personnel, and OOD/JOOD demonstrate their knowledge of the following, as appropriate:			
Naval procedure, when used with international procedure?	2		
International procedure?	1		
Composition of normal/international flagbag?	1		
Use of substitutes?	1		
How to question a hoist?	1		
How to spell by flaghoist?	1		
How to signal bearings?	1		

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Figure 2-5.—Visual communication exercises.

	Weight	Yes	No
International procedures when used to supplement the Allied Naval Signal Book?	2		

2. Personnel performance (60 points)

	Weight	Yes	No
Did signalmen break all calls and signals correctly?	4		
Did all personnel operate proficiently with a minimum of confusion?	2		
Did CIC break signals in time to assist the tactical communicator?	4		
Was proper procedure and terminology used in hoisting flaghoists?	4		
Was all necessary equipment operational and ready prior to commencement of the exercise?	5		
Was the visual log properly maintained?	4		
Were there effective communications between the signalmen and the tactical communicator?	5		
Did the OOD/JOOD respond to the signal of execution promptly?	4		
Was more than one signal properly separated?	4		
Did the tactical communicator:			
Decode signal in less than 2 minutes?	10		
Encode signal in less than 3 minutes?	10		
Did the signalmen hoist signals within 30 seconds of receipt from tactical communicator?	5		
Were calls and substitutes broken prior to passing to the tactical communicator?	4		
Did operators adhere to procedures as promulgated in ACP 129?	5		

3. Reliability (20 points)

	Weight	Yes	No
Were signals hoisted correctly the first time?	10		
Were signals spotted correctly the first time?	10		

Flagbag Speed:

A. Encode: Timing from the time a hoist is given to signal supervisor to time hoist is closed up on exercise ship.

B. Decode: Timing from the time a hoist is closed up on assist ship to time hoist is correctly hoisted to dip by exercise ship and correctly passed to the tactical communicator.

C. Tactical Communicator's Speed.

(1) Encode: Timing from time "plain text" is given to tactical communicator to time encoded signal is given to the signal supervisor.

(2) Decode: Timing from time hoist is correctly received by the tactical communicator until he reports understood to observer (he will then close up signal and give meaning to observer).

Figure 2-5.—Visual communication exercises—Continued.

FLASHING LIGHT PROCEDURES Z-21-C

PURPOSE

Train and evaluate signal bridge personnel in the use of directional/nondirectional flashing light (infrared may be directed by OCE).

REQUIREMENTS

Demonstrate the ability to communicate using directional and/or nondirectional flashing light (with infrared as appropriate).

This exercise may be conducted separately or concurrently with other exercises.

The infrared portion of this exercise is suitable as an individual exercise or may be conducted in conjunction with the directional and/or nondirectional portion of this exercise.

PROCEDURES

OCE

Designate or assign:

- Exercise ship.
- Assist ship.
- Exercise observer(s).
- Starting time and duration of the exercise.
- Directional/nondirectional/infrared procedures.

Require each transmitting ship to send at least three messages.

ASSIST SHIP(S)

As directed by the OCE:

- Transmit a minimum of three messages with a minimum of 25 groups in either plain or coded format.
- Station observers.
- Maintain a complete log, file, and list of all procedural errors.
- Preface and end each message with the word "DRILL".
- Insert appropriate operating signal meaning "DRILL" in the transmission instruction of each exercise message.

EXERCISE OBSERVER

Observe and grade exercise.

Maintain an accurate record of all discrepancies.

Critique exercise personnel upon completion of the exercise.

Submit the evaluation report with comments as required to the OCE.

EXERCISE SHIP

Maintain a complete log of exercise traffic.

Maintain a record of all errors and/or corrections.

Preface and end each message with the word 'DRILL".

Insert appropriate operating signal meaning 'DRILL" in the message instruction of each exercise message.

Figure 2-5.—Visual communication exercises—Continued.

Transmit messages as directed by the OCE.

EVALUATION

	Weight	Yes	No
Did signal bridge personnel perform proficiently with a minimum of confusion?	15		
Was the visual log maintained?	10		
Did signalmen adhere to flashing light/infrared procedures as promulgated in ACP 129?	15		
Was all necessary equipment operational and ready prior to commencement of the exercise?	15		
Did signalmen demonstrate a working knowledge of all equipment installed?	10		
Were effective communications between signalmen and OOD established (if applicable)?	10		
Were letters and numbers transmitted correctly?	15		
Did the operator(s) send and receive at the speed required of his rate?	10		

SEMAPHORE **Z-22-C**

PURPOSE

Train and evaluate communication personnel in the use of semaphore for exchange of administrative traffic and tactical information between ships at sea at close range.

REQUIREMENTS

Demonstrate ability to communicate using semaphore.

PROCEDURES

OCE

Designate and assign:

Exercise ship.

Assist ship(s).

Exercise observer.

Starting time and duration of exercise.

ASSIST SHIP(S)

Transmit a minimum of three messages with a minimum of 25 groups per message.

Use plain language.

Require each participating ship to transmit a minimum of three messages.

Transmit messages to all exercise ships simultaneously.

Ensure observers are on each exercise ship.

EXERCISE OBSERVER

Observe and grade exercise.

Critique exercise personnel upon completion of exercise.

EXERCISE SHIP(S)

Maintain a complete log of exercise traffic.

Submit a copy of all drill traffic to OCE.

Preface and end each message with the word "DRILL".

Insert the operating signal signifying drill in the transmission instructions of each exercise message.

Figure 2-5.—Visual communication exercises—Continued.

EVALUATION

	Weight	Yes	No
1. Personnel performance (100 points)			
Did communications personnel perform efficiently with minimum confusion?	15		
Was supervisor able to control his personnel effectively?	15		
Did signalmen adhere to semaphore?	15		
Was all necessary equipment operable and ready for commencement of exercise?	10		
Did signalmen demonstrate a high degree of reliability?	15		
Were there effective communications between signalmen and OOD?	10		
Was visual log properly maintained?	10		
Were letters and numbers transmitted correctly?	10		

CHALLENGE AND REPLY Z-23-C

PURPOSE

Train deck watch officers and signalmen in the use of recognition procedures. To evaluate coordination between deck watch officers and signalmen in using recognition procedures.

REQUIREMENTS

Demonstrate knowledge and use of recognition procedure.

PROCEDURE

OCE

Assign an observer to the conning bridge and one to the signal bridge of the exercise ship.

Inform exercise ship that the ship is in a simulated formation with other ships and unidentified surface crafts are present.

EXERCISE OBSERVER

Introduce the following recognition and challenge and reply problems:

Unidentified warship bearing __________.

Unidentified merchant ship bearing __________.

Exercise ship challenged with merchant ship challenge.

Exercise ship challenging and being challenged simultaneously.

Observe and evaluate exercise.

Critique exercise personnel upon completion of the exercise.

Submit the evaluation report with comments as required by the type commander to the OCE.

EXERCISE SHIP

Man signal bridge, conning bridge, and JX circuit at each station.

Designate one officer to assume role of commanding officer.

Carry out complete recognition procedures for each unidentified ship report received from signal bridge.

EVALUATION

	Weight	Yes	No
Were signalmen cognizant of difference between high and low security ships?	10		

Figure 2-5.—Visual communication exercises—Continued.

	Weight	Yes	No
Were signalmen cognizant of responsibility for initiating challenge if in company with other units?	10		
Were signalmen cognizant of who has responsibility for decisions concerning challenge and reply?	10		
Did acting commanding officer make all decisions concerning challenge and reply?	10		
Did signalmen check equipment and report ready or defective to the commanding officer?	10		
Did signalmen make verbatim report of all responses from contact?	10		
Did exercise personnel adhere to procedures as promulgated in ACP 150 series?	10		
Did communications personnel perform efficiently with a minimum of confusion?	10		
Was all necessary equipment operational and ready prior to commencement of exercise?	10		
Were communications effective between signalmen and the OOD?	10		

Note

Since the sole responsibility for decisions relative to recognition rests with the commanding officer or his designated representative, this exercise should always include OODs.

COMMUNICATIONS OPERATIONAL PLANNING Z-40-C

PURPOSE

Train and evaluate shipboard communications personnel in the preparation of the shipboard communications plan.

REQUIREMENTS

Shipboard personnel responsible for planning of communications:

Communications officer.

Assistant communications officer, as applicable.

Radio officer, as applicable.

Signal officer, as applicable.

Communications watch officers, as applicable.

Communications/operations leading petty officers.

Communications/operations supervisors.

PROCEDURES

OCE

Designate the exercise ship.

Assign an exercise observer/evaluator.

Designate the reference OPORD(s) in accordance with the type of mission(s) assigned the exercise ship.

Prescribe the time frame to be covered by the communications plan.

Figure 2-5.—Visual communication exercises—Continued.

EXERCISE OBSERVER

Evaluate the exercise in accordance with the criteria contained in this exercise.

Submit an evaluation report to the OCE and the exercise ship.

EXERCISE SHIP

Provide a shipboard communications plan and a frequency plan in accordance with the OCE's instructions and the outline in paragraph 670b as applicable to the ship/unit.

Submit a copy of the communications plan to the exercise observer for evaluation.

Use the communications plan in accordance with OCE's instructions.

EVALUATION

	Weight	Yes	No
Was the proper classification assigned each page?	2		
Was the communications plan comprehensive?	8		
Were all available or directed references used?	5		
Were all missions/transits/port calls or commitments planned for?	15		
Was the frequency plan complete as to:			
All evolutions planned for?	4		
All required circuits listed?	4		
All emission codes listed?	4		
Equipment allocations listed?	4		
Remote terminals listed?	4		
Circuit restoration priorities listed?	5		
Circuit activation priorities listed?	5		
Key lists and crypto equipment listed on covered circuits?	4		
Were special objectives, performances, or evaluations listed?	3		
Was the task organization list complete?	5		
Did the call sign list include:			
International call signs?	4		
Task organization call signs?	4		
Pennant calls?	4		
Did the visual requirements include:			
NANCY requirements?	8		
Proper challenge and reply key lists?	8		

Figure 2-5.—Visual communication exercises—Continued.

points to a lesser degree if circumstances indicate. Additionally, if performance or material readiness is of exceptionally poor quality, the senior observer may deduct an amount greater than that indicated. Final grades will be obtained by subtracting total credit lost from 100 to arrive at the exercise grade.

Security

Any action resulting in a reportable security violation, or any action that if not stopped or prevented by an observer would have resulted in a reportable security violation, will cause an exercise to be evaluated "Unsatisfactory, no numerical grade assigned" and the exercise will be terminated at that point. Reportable violations are those required to be reported the next step up the chain of command by applicable publication. This step can be as low as operator to supervisor. Examples: operating crypto equipment with tempest violation; unauthorized/disclosure viewing.

All security violations of a non-reportable nature, that is any non-adherence or compliance to a security regulation not covered here, will result in the loss of five points credit, except three or more of these non-reportable violations during the conduct of an exercise will result in that exercise being evaluated "Unsatisfactory, no grade assigned." Examples of non-reportable violations are: classification not in larger letters than other text on page; improper classification of extracts (not resulting in loss of material).

Communications Operational Planning Exercise

This exercise (Z-40-C) provides training and evaluation in planning communications operational needs aboard ship. It requires the combined efforts of operations and communications personnel, both signal and radio, to research the governing OPORDS and plan all the communication requirements. The shipboard communications plan developed can be for an actual operation or a constructive facsimile according to the OCE's requirement.

Communications Plan

A ship's communications plan lists all the communications requirements in detail for a specific operation, at-sea/in-port period, or combinations thereof, covering a specified period of time. It contains all the sequential events and supporting information required for operations and communications personnel to meet and successfully achieve the communications commitments of a ship. It is a test of the ability of department/division officers, leading petty officers, and supervisors to research effective OPORDS for all communications requirements assigned their ship and combine them into an effective plan that can be instituted by the working personnel.

CHAPTER 3

NAVAL COMMUNICATIONS

The successful outcome of many earlier naval engagements depended as much on reliable communications as on expert seamanship. This result points up the realization that without good communications coordinated action between ships of the fleet is impossible.

One of the earliest records (1778) of a communication system was a set of simple maneuver and recognition signs. Over the years, this system was modified and improved, but during the Civil War, with many Federal officers going over to the Confederacy, signals had to be revised. In 1862, the U.S. Army signal system was adopted by the Navy. Army-style communications continued dominating Navy signaling as late as 1892.

Semaphore came into use in the Navy in 1861. This semaphore method was the forerunner of the present-day flashing light system, which was adopted in 1864. The former system utilized a lantern, ball, or similar object, which was exposed, or a flag that could be lowered and raised in dit-dah patterns. The latter system utilized a lantern inside a canvas cylinder, which was attached to the rigging in such a way that it permitted the light to be screened or exposed by pulling or releasing an attached line.

Electricity came into naval communications in 1875, when experiments with electric lights were conducted. In 3 years the ranges of these lights were increased from 6 miles to a distance of nearly 17 miles.

The wireless came along in 1895, and by 1903 radio was operational throughout the United States Fleet.

In the old days, because of poor communications, naval warfare was largely a matter of guesswork. A fleet commander often did not know where his own ships were or what they were doing–let alone what the enemy was up to. In contrast, today, no matter how deep into hostile waters a force may penetrate, the commander knows where his ships are, and he receives intelligence reports on what the enemy is doing.

MISSION, POLICY, AND BASIC PRINCIPLES

In this missile age, it is a foregone conclusion that any future war would not allow a period of grace during which to procure vast amounts of equipment nor train thousands of new men. Any future general war, it has often been stated, will be won or lost in hours or days instead of years. Naval communications–a function of command–must always be in a condition of preparedness. In the event of hostilities, operating forces would have to depend on then-existent communication facilities.

A navy that operates on a worldwide scale requires services of a global communication network. A commander must be able to pass the word–to communicate–whenever necessary, in any mode, between and among ships separated by varying distances, and also from ships to and from shore stations, aircraft, and satellites. Ability to communicate makes possible effective command and control, ensuring that every mobile nerve center in the fleet is responsive to tactical and strategic needs and services of every other element. Major shore stations in today's Defense Communications System form the global network that is the backbone of strategic naval communications, spreading their circuits wherever a U.S. Navy mission requires communications.

A force of ships is never out of touch with its base of operations. In support of the force is a global organization of communication stations with hundreds of radio and landline circuits. Orders and information affecting the successful outcome of a force's mission are exchanged swiftly and accurately throughout every level of command. A tightly directed fighting unit is the direct result of reliable communications.

MISSION

The mission of naval communications is to provide and maintain reliable, secure, and rapid communications, based on war requirements adequate to meet the needs of naval command; to facilitate administration; to satisfy as directed, Joint Chiefs of Staff (JCS) approved joint requirements; and to manage, operate, and maintain facilities in the Defense Communications System (DCS) as assigned by JCS.

POLICY

The policy of naval communications is to–

1. Establish and maintain effective communications within the Department of the Navy.
2. Encourage at all levels of command an effort to improve techniques, procedures, and efficiency.
3. Cooperate with the military services, Defense Communications Agency, and other departments and agencies of the U.S. Government and Allied Nations.
4. Encourage development of amateur and commercial communication activities of the United States for enhancing their military value and for safeguarding the Nation's interests.
5. Maintain facilities for adequate communication with U.S. merchant marine, aircraft over the sea, and appropriate U.S. and foreign communication stations in order to promote safety of life at sea and in the air.

BASIC PRINCIPLES

Naval communications must meet the requirements of war. Peacetime organization, methods, procedures, facilities, and training must be such that only minor changes are required when shifting to an emergency or war status. Based on the foregoing concept, certain basic principles have been proven under war time conditions.

1. Reliability, security, and speed are fundamental requirements of naval communications. Reliability is always paramount; it must never be sacrificed to achieve security or speed. When a conflict arises between demands of security and speed, however, one or the other must be sacrificed in the light of demands of the situation.
2. Effective communications require a knowledge and appreciation of how, when, and where to send messages. Instructional publications and the latest equipment in no way lessen need for initiative, commonsense, and good judgment in planning and conducting naval communications.
3. Correct methods of operation and precise use of established procedures are essential to effective communications.
4. Administrative planning and foresight are required to ensure that rapid communications are employed.
5. Proper choice of frequency is of the greatest importance in establishing and maintaining reliable radio communications.
6. Communication media susceptible to interception should not be used in wartime when a more secure means will serve.

ORGANIZATIONAL ELEMENTS OF NAVAL COMMUNICATIONS

Following are the major elements of naval communications.

1. Director, Naval Communication Division
2. Commander, Naval Communications Command
3. Naval Security Group
4. Communication organizations of operating forces.

Director, Naval Communication Division

The Chief of Naval Operations maintains direct cognizance over naval communications by utilizing his Director, Naval Communication Division. The Director, Naval Communication Division maintains a dual role, serving also as Commander, Naval Communications Command.

Commander, Naval Communications Command

The mission of Commander, Naval Communications Command is to exercise authority over the readiness, operating efficiency and security of Naval Communications throughout the Department of the Navy; to provide, operate and maintain adequate and secure Naval Communications; to approve requirements for the use of existing communications capabilities and resources; to coordinate radio frequency communications programs; to administer and coordinate radio frequency matters and to exercise command authority over, and be responsible for the primary support of the shore (field) activities of the Naval Communications System as a Naval Service-wide System, and such other activities and resources as may be assigned.

The shore activities of the Naval Communications System include communications stations, radio stations and communication units.

A naval communication station (NAVCOMMSTA) consists of communication facilities and ancillary equipment required to provide essential fleet support and fixed communication services for a specific area.

A naval radio station (NAVRADSTA), usually a remote component of NAVCOMSTA, performs either radio transmitting or radio receiving functions. To indicate the function performed, the designated letter T or R is added in parentheses to the activity; e.g., NAVRADSTA(T) Cutler, Maine.

A communication unit (NAVCOMMU) is assigned a limited or specialized functional mission. It thus is smaller in terms of personnel and facilities than its NAVCOMMSTA counterpart.

Naval Security Group

The Naval Security Group (NAVSECGRU) is a worldwide organization that provides protection of naval communications by directing the communication security effort. It furnishes cryptographic equipment for the Department of the Navy (including the U.S. Coast Guard), and administers the Registered Publication System. It also, supervises the naval portion of the Armed Forces Courier Service (ARFCOS), and perform cryptologic and related functions based on requirements originated or placed upon the Chief of Naval Operations (CNO). It also performs special functions in connection with communication electronic intelligence.

Communication Organizations of Operating Forces

At operating force level, communications is the voice of command in a visible and tangible way. Aboard ship the communication organization is under direct and positive control of the commanding officer. Communications directly and materially influences the degree of success achieved by a combat unit.

DEFENSE COMMUNICATIONS

The Defense Communications System (DCS) comprises major portions of individual Army, Navy, and Air Force communication complexes brought together under a single system to provide a single system response to the Department of Defense worldwide communication needs. Military departments continue to maintain and operate their assigned portions of DCS, but they are responsive to overall operational control and supervision of the Defense Communications Agency (DCA), the management agency for DCS.

With certain exceptions, DCS includes all Department of Defense circuits, terminals, control facilities, and tributaries, regardless of the military department to which they are assigned. Of particular significance to the Navy, the implementing directive states that DCS normally does not include land, ship, and airborne communication facilities of broadcast, ship-to-shore, ship-to-ship, and ground-air-ground systems. Tactical circuits within a tactical organization usually are excluded from DCS.

The Defense Communications Agency is an activity of the Department of Defense under authority and control of the Secretary of Defense. The chain of command runs from the Secretary of Defense through the Joint Chiefs of Staff to the Chief, DCA.

Operational control and supervision of DCS is accomplished through a complex of communication control centers. Functions and tasks associated with control centers are to tabulate, assemble, store, and display information on current conditions of components of the system; allocate channels and circuits to meet requirements of authorized users; and perform continuous system analysis and such other tasks as become necessary. The principal objective of this control center system is to assure the greatest possible responsiveness of DCS to the needs of its users.

Communication control centers receive and process performance data based on hourly and spot reports made by various DCS reporting stations on networks, circuits, channels, and facilities of DCS. These reports provide a knowledge of the status of DCS at all times. Control centers know of traffic backlogs; of circuit conditions and status of installed equipment at some 200 switching centers throughout the world; and status of channels allocated to various users. With this knowledge and that of alternate route capabilities between any two points, spare capacity, and radio propagation conditions, control centers restore elements and reallocate channels according to needs and priorities of users.

The heart of the communication control center complex is the Defense Communications Agency Operations Center (DCAOC), located in the Washington, D.C. area. In this automatic processing center, complete information on communication traffic and system status throughout the world is processed and acted upon.

Information presented on display panels in the operations center covers the full range of data required to analyze intelligently this worldwide communication system. Included in this information are trunk status, assignment, and availability of individual circuits, station status, and scope priority, and quantity of message backlog.

Subordinate to the DCA Operations Center are four Defense Area Communications Operations Centers (DACOCS). These control centers exercise operational control and supervision of DCS components in their geographical areas. The Pacific DACOC is located in Hawaii; the European DACOC at Dreux AFB, France; the Alaska DACOC at Elmendorf AFB, Anchorage; and the Continental U.S. DACOC at Fort Carson, Colorado.

Subordinate elements of DACOCs include Regional Communications Operations Centers (DRCOCs) in the Philippines, Japan, Labrador, England, Spain, Panama, and Turkey. Thus, a total of 12 area and regional control centers throughout the world provide control facilities that permit the DCS in their particular areas to be responsive to changing needs of area commanders.

JOINT AND ALLIED COMMUNICATIONS

The need for coordinated and standardized communications among military services has been apparent for many years, particularly since the early stages of World War II. Army and Navy facilities occasionally were duplicated locally, and differences in procedures made efficient interservice communications difficult. Communication procedures now are standardized within the Department of Defense. No longer is the handling of interservice messages a special problem. Joint procedures are set forth in Joint Army-Navy-Air Force Publications (JANAPs).

Allied Communication Publications (ACPs) are promulgated to meet the need for standardized communications on an allied basis. The ACP series of publications provides communication instructions and procedures essential to conducting combined military operations.

VARIOUS TYPES OF MESSAGES

A message is any thought or idea expressed briefly in plain or cryptic language, prepared in a form suitable for transmission by any means of communication. A leading Signalman must have a knowledge of various types of messages, including single- and multiple-address messages, basegrams, and special category messages. Mastery of these messages must be gained in order to advance to SM1 and SMC.

As a general rule, all messages or rapid communications can be subdivided into two broad headings–operational and administrative.

Operational communications direct or affect the actual movement of forces, ships, troops, and aircraft to or in combatant areas, whether real or simulated. Some examples are: combat intelligence; enemy reports or information having vital bearing upon the disposition, movement, or employment of forces; strategic or essential weather reports; control of communication; cryptography; deception countermeasures; and combat logistics.

Administrative communications deal with routine matters, such as personnel, noncombatant logistic requirements, and similar subjects. Normally the highest precedence assigned to administrative traffic is priority.

Messages can be in a number of forms. These forms are outlined more fully in DNC 5, ACP 124, ACP 127, 129, and in *Signalman 3&2*. They are listed here, however, for review purposes.

- Naval message forms: plaindress, abbreviated plaindress, and codress.
- Commercial message forms: international and domestic telegraph.
- Service message forms: supervisory wire, abbreviated service messages, and service messages.

CLASSES OF MESSAGES

For administrative purposes (particularly accounting), there are five classes of messages–A, B, C, D, and E. They are further identified as Government and non-Government. Each class is described in the next two topics.

Government Messages

Government messages are classed as A, B, and C.

Class A: Official messages and replies thereto, originated by the Department of Defense (including the Coast Guard when operating as a part of the Navy).

Class B: Official messages of United States Government departments and agencies other than Department of Defense. (Coast Guard is included under Class B except when operating as a part of the Navy.) Class B traffic may be handled by naval communications to the extent that it will not cause any need for increase in facilities above military requirements. Such traffic takes precedence after class A traffic. It is carried free of charge over naval nets and circuits. NOTE: According to provisions of NWP 16, the American Red Cross (AMCROSS) is allowed certain specified privileges of Naval Communications for messages that relate to administration and emergency warfare in connection with Red Cross activities, duties, and functions. Red Cross messages are handled as Class B messages and normally are in plain text.

Class C: A broadcast message in a special form available to ships of all nationalities (data consisting of special services, such as hydrographic notices, weather forecasts, and time signals). Class C traffic is handled free of charge by naval communications.

Non-Government Messages

Non-Government messages are classed as D and E.

Class D: Commercial messages requiring tolls, including press and radiophoto. All class D messages are private (unofficial) messages on which all charges are collected from the sender, including ship transmission charge, shore station receiving charge, and tolls involving landline or cable transmittals.

Class E: Acceptable personnel messages to or from naval personnel and specifically authorized civilian personnel stationed on naval vessels or overseas naval stations to or from addressees in the continental United States. Class E traffic is handled without cost over Navy circuits. Originators in the continental United States, however, must bear the cost of forwarding via commercial facilities to one of the appropriately designated NAVCOMMSTAs authorized to accept these messages. Conversely, shipboard originators must bear the cost of transmission from the point where delivery requires the message to enter commercial channels.

GENERAL MESSAGES

A general message has wide standard distribution. Each message has an identifying title and each title has a serial number, in a yearly calendar sequence. Commands directly concerned receive general messages as action addressees. It is their responsibility to determine what action, if any, should be taken. Addressees not under jurisdiction of the originator, or in an area outside that covered by a general message, may receive copies for information only.

A copy of each general message appropriate to the command is placed in the general message file, subdivided by titles, and filed according to serial numbers. General messages are retained until canceled or superseded. When practicable, the originating office cancels general messages. Originators of each series of general messages promulgate, as the first message of that series for the calendar year, a list of previously issued messages of that series that remain effective. Exceptions to this custom are general message series incorporated into the Navy Directives System, and those consolidated into the *Communications Security Publication Manual*(CSPM).

General messages incorporated into the Navy Directives System, in accordance with SecNav-Inst 5215.1 (ALNAV, ALNAVSTA, ALSTACON, ALSTAOUT, NAVACT, NAVOP, and such others as may be prescribed by issuing authorities), are canceled as follows:

1. By a superseding message or directive.
2. By cancellation date indicated in message text.
3. At the expiration of 90 days from release date if neither step 1 nor 2 has occurred, or when their contents are incorporated into RPM or CSPM.

Distribution of general messages is in accordance with the distribution chart contained in NWP 16. Automatic distribution of all general messages contained therein is accorded the Chief of Naval Operations.

Commanders of sea frontiers, commandants of naval districts and river commands, and fleet, force, and type commanders are authorized to establish general message series within their respective commands.

General messages for minor Navy and Marine Corps shore activities are transmitted by rapid means when served by a direct teletypewriter network. Otherwise, such messages normally are sent to lower echelons by mail or other appropriate local means as determined by the refile authority. Commercial refile is employed only when an originator requires rapid delivery to lower echelons.

Types of General Messages

Types of general messages are given in the following lists. Each type carries an identifying title, and is intended for a certain standard set of addressees.

ALCOAST: Originated by Commandant, Coast Guard. An ALCOAST is the Coast Guard equivalent to ALNAV. The Navy is responsible for delivery to Coast Guard units operating directly with the Navy.

ALCOM (to all commands): Originated by CNO, COMNAVCOM, COMNAVSECGRU. An ALCOM designates those general messages designed for (but not restricted to) promulgation of communication information such as policy matters, Comm-Pub Corrections, RPS matters. Unless specifically requested by the drafter or releasing officer, ALCOMs are not sent by rapid means to naval missions, advisory groups, aid groups, attaches, or liaison officers. When distribution of a classified ALCOM to any of these activities is considered unnecessary or undesirable, the drafter or releasing officer specifically indicates this opinion. An unclassified filler sheet, instead of the ALCOM, then is mailed to the non-receiving activity.

ALCOMLANT: Originated by CNO, COMNAVCOMM, or COMNAVSECGRU. The ALCOMLANT is a subdivision of the ALCOM series for the Atlantic-Mediterranean areas. NOTE: ALCOMLANTs may be originated by CINCLANTFLT when time will not permit or the need does not actually exist for coordination with CNO. ALCOMLANTs originated by CINCLANTFLT will be numbered sequentially and will be suffixed with the letter "A."

ALCOMPAC: Originated by CNO, COMNAVCOMM, or COMNAVSECGRU. The ALCOMPAC is a subdivision of the ALCOM series for the Pacific area. NOTE: ALCOMPACs may be originated by CINCPACFLT when time will not permit or the need does not actually exist for coordination with CNO. ALCOMPACs originated by CINCPACFLT will be numbered sequentially and will be suffixed with the letter "P."

ALDIST: Originated by Commandant, Coast Guard. Its purpose is to provide instructions, including those of policy level, or information of limited applicability, chiefly to Coast Guard district commanders.

ALLANTFLT: Originated by CINCLANTFLT. An ALLANTFLT is equivalent to ALNAV or NAVOP with reference to commands under CINCLANTFLT.

MERCASTLANT: The merchant ship equivalent to an ALLANTFLT.

ALMAR: Originated by Commandant, Marine Corps. An ALMAR is equivalent to ALNAV or NAVOP with reference to the Marine Corps. The Navy is responsible for delivery to Marine Corps units operating with U.S. Naval forces.

ALMARCON: Originated by Commandant, Marine Corps to Marine Corps activities within the continental United States.

ALMSTS: Originated by COMSTS for distribution in accordance with COMSTS Instruction 2110.2.

ALNAV: Originated by the Secretary of the Navy (SECNAV). Designates general messages that normally concern functions of the entire Naval Establishment including the Marine Corps. The ALNAVS are unclassified.

ALNAVSTA: Originated by the Secretary of the Navy. Designates general messages (similar to ALNAV in content) requiring wide dissemination to Navy and Marine Corps shore establishments, including shore-based elements of operating forces. The ALNAVSTAs are unclassified.

ALPACFLT: Originated by CINCPACFLT. An ALPACFLT is equivalent to ALNAV or NAVOP within commands under CINCPACFLT.

MERCASTPAC: Merchant ship equivalent to an ALPACFLT.

ALSTACON: Originated by SecNav. Designates general messages that contain administrative information requiring wide dissemination to all stations within the continental United States. Normally ALSTACONs are unclassified.

ALSTAOUT: Originated by SecNav. Designates general messages that contain administrative information requiring wide dissemination to all stations outside the continental United States. The ALSTAOUTs are unclassified.

JANAFPAC: Originated by CINCPAC, who designates general messages pertaining to the unified command under CINCPAC.

JAFPUB: Originated by Joint Chiefs of Staff (Military Communications Electronics Board) (MCEB). Designates general messages that promulgate information pertaining to JCS (MCEB)-adopted publication when rapid dissemination to all branches of the armed forces is required. (Ordinarily, this action is taken when information from JCS (MCEB) is peculiar to a single service concerned.)

LANTFLTOP: Originated by CINCLANTFLT. Designates general messages concerning fleet units and their operational commander within commands under CINCLANTFLT.

NAVACT: Originated by SecNav. Designates general messages that are similar to ALNAV in content, except that the Marine Corps is excluded.

NAVOP: Originated by CNO. Promulgate information to all subordinate commands and activities of the Naval Establishment.

MERCAST: Originated by CNO. A MERCAST is the merchant ship equivalent to ALNAV. Distribution is made to ships guarding MERCAST schedules, MSTS, naval port control officers, and NCSOS.

MERCASTLANT: Originated by CINCLANTFLT. A MERCASTLANT is the merchant ship equivalent to ALLANTFLT.

MERCASTPAC: Originated by CINCPACFLT. A MERCASTPAC is the merchant ship equivalent to ALPACFLT.

SPECIAL CATEGORY MESSAGES

Special category messages are made up of special message warnings, all ships present messages, Q messages, and hydro and NOTAM messages.

Special Message Warnings

Special message warnings are sent during emergencies (in peacetime and during times of disaster or war). Precedence is the highest that can be assigned. Special message warnings fall in the following categories:

1. Hurricane, typhoon, or tidal wave warnings.
2. Reporting unidentified contacts with submarines.
3. Initial enemy contact reports.
4. Immediate amplifying reports to the preceding three groups.

All Ships Present Messages

All ships present messages are addressed to all ships present within visual signaling range. These messages normally emanate from the senior officer present afloat. The SOPA prescribes local instructions governing initiation, transmission, and relay of all ships present messages. For further details on the port or anchorage in question, refer to shipboard copy of SOPA Instructions and Fleet Guides.

Q Messages

The Q message system serves as the classified portion of navigational warning system of Allied Nations. These Q messages should not be confused with Q signals. The Q code of signals are the operating signals contained in ACP 131. Details for Q messages are contained in Allied Hydrographic Publication (APH 1(A)).

Hydro and NOTAM Messages

The U.S. Navy Oceanographic Office originates messages for which wide, nonstandard distribution is indicated. These messages may be serially numbered and are transmitted on hydrographic broadcast. Information relating to the Atlantic, Mediterranean, and Indian Oceans is contained in HYDROLANTS; to the Pacific Ocean, in HYDROPACS.

Military and civil agencies concerned with safety of aircraft originate NOTAMs. These notices contain information relating to establishment, discontinuance, condition, or change of any aerological facility or service, or to a hazard within a specified area. Air stations and facilities whose operations may be affected are recipients of NOTAMs.

BASEGRAMS

A basegram is a message designation connoting a means of delivery for general messages of insufficient operational importance to warrant immediate delivery to forces afloat by fleet broadcasts, but for which rapid delivery is desirable. A shore commander is designated by competent authority as the basegram authority. He is responsible for providing plain text copies of basegrams to forces afloat upon call.

The basegram system reduces the volume of message traffic transmitted by fleet broadcast so that relatively limited broadcast facilities are available for messages that must be delivered by rapid means. This system provides a means by which all afloat forces can obtain general messages from designated basegram authorities.

The basegram is processed in the following manner: General message originators assign the designation basegram to applicable messages. After the general message identification, the first word of the text is the word "basegram." The communication center serving the originator places the operating signal ZFO (meaning basegram) in message instructions.

Basegrams are delivered by rapid means to designated basegram authorities for ultimate pickup by afloat forces, and to appropriate broadcast stations that originate procedure messages announcing the basegrams.

Basegrams are also transmitted over point-to-point circuits to shore commands and activities contained in the address, in the same manner as any other message.

Broadcast stations receive appropriate basegrams by rapid means. They do not broadcast actual basegrams, but originate and broadcast a procedure message for each basegram, indicating that it was routed to basegram authorities.

When classification of a general message permits, the procedure message indicates the subject matter. For example, ALNAV 23 concerns promotion of LTs to LCDRs. (A abbreviated service message may refer to more than one general message.)

Stocks of plain text copies of the following general messages are maintained by basegram authorities, and edited as necessary, for pickup by afloat forces: ALNAV, NAVOP, ALCOM, ALCOMLANT (Atlantic and NELM), ALLANTFLT (Atlantic and NELM), JAFPUB, ALCOMPAC (Pacific), ALMAR, NAVACT, and ALPACFLT (Pacific).

Basegram authorities also deliver basegrams by mail to afloat forces deployed in their area when such forces are scheduled to enter nonbasegram ports where normal mail service is provided.

Each afloat command maintains a general message receipt log for each addressed general message series. This log indicates by consecutive number any general messages not yet received and those general messages for which only basegram procedure messages were received. Afloat commands utilize this log to determine appropriate general messages to be obtained from basegram authorities.

Designated basegram authorities are listed in DNC 5. (Additional basegram authorities are sometimes designated by local fleet commanders.) By using this list and the current general message file on board, a communication officer ensures receipt of all general messages, including basegrams.

RESPONSIBILITIES OF ORIGINATOR

The command by whose authority a message is sent is the originator of that message. Any individual may compose a message, or be authorized to release a message, but the commander is always the originator. As such he is responsible for all messages released from his command.

First responsibility of an originator is to ascertain if a message is necessary. If a speed letter or a letter utilizing airmail would hasten the necessary information to its destination in time for proper action, a message should not be used. If action is not required within 72 hours and addressees are in the continental limits, U.S. mail or airmail should be used. When overseas or afloat addressees are involved, the necessity for a message is left to the originator's discretion.

The second definite responsibility of an originator is to designate addressees. An originator must keep addressees to a minimum. Addressees should be limited to those who need to know.

An originator is also responsible for determining the security classification to use on a message. A message should be assigned the lowest classification feasible. Sometimes a lower classification is made possible by a slight redrafting of a message. Be sure that the classification is correct in terms of information it actually gives or implies. Chapter 15 of *U. S. Navy Regulations* contains instructions for deciding the proper classification of messages.

An originator must also assign precedence. High precedence should be reserved for messages requiring immediate action. Precedence should be correct in terms of the hour delivery to the addressee actually is required. Time differences and peak traffic periods naturally are considered.

MINIMIZE

When communication facilities are severely overloaded, drastic reduction of message and telephone traffic may be necessary. To ensure prompt handling and transmission of vital messages in an emergency—either actual or simulated—instructions to reduce traffic are made by promulgation of the word minimize. This condition has the following significance: "It is now mandatory that normal message and telephone traffic be reduced drastically so that vital messages connected with the situation indicated shall not be delayed."

Minimize may be imposed on a worldwide, nationwide, command, or area basis, as appropriate. A message ordering minimize must consist of the word minimize, followed by scope, area affected, reason, and duration (if known). The type of traffic, communication service, or circuits to be included or exempted from minimize may also be indicated. A distinct advantage of visual communications is that it is not affected by MINIMIZE.

ORIGINATOR RESPONSIBILITIES DURING MINIMIZE

Before authorizing transmission of a message, or making a telephone call, originators must satisfy themselves that immediate operations will be advesely affected if the message or call in question is not made. Messages or calls that do not pass this test must not be originated.

Messages that are not connected with immediate operations but must be made should be cleared by civil telegraph or mail where these facilities exist and their use is permissible. Failing this clearance, they must be held until minimize is canceled.

Originators have authority, however, to dispatch messages at any time they consider that messages have been held up so long that it has become vital for them to be sent.

Lifting of minimize is achieved by the order: "Cancel Minimize." This order is made by authority of the person who originally ordered minimize.

WARTIME PROVISIONS FOR VISUAL SIGNALING

Chapter 16 of NWP 16 furnishes instructions for instantaneous transition from communication procedures in time of peace to those for wartime or other emergencies. Provisions of the chapter are implemented by the Chief of Naval Operations who issues the directive "EXECUTE CHAPTER SIXTEEN NWP SIXTEEN." Immediately upon receipt of the directive, commanders must initiate the measures indicated in that chapter.

Stipulations of chapter 16 of NWP 16 are classified, hence they cannot be covered in this text.

MESSAGE PROCESSING

The originator of a message is the command by whose authority the message is sent. An individual who actually composes a message is called the drafter. He is responsible for seeing that the text is accurate, brief, and clear. He ensures that any references used in the message are effective and held by all addressees.

Every communication is created for a specific purpose. These purposes may be summarized as follows:

1. Commands must be ordered to take some action now or later.
2. Information must be exchanged among commands.
3. A report or recommendation must be submitted to a senior.
4. A question must be asked (or an answer given).
5. Assistance must be requested.

In many instances, either a message or a signal could be used. Different circumstances govern an originator's decision to communicate either by message or by signal. If the OTC wants his formation of ships to turn quickly to avoid a possible collision, he might order the turn by radiotelephone or by flaghoist. At such a time, where speed of execution is highly important, the message form and the communication medium selected must give the greatest possible speed as well as assurance of accurate execution. Another example would be when ships in company, nearing port after a voyage, submit their logistic requirements to the OTC. Such messages normally would be sent by radio, unless radio circuits were overloaded with traffic of higher priority, in which event either flashing light or semaphore would be used.

One of the first questions to be considered in any communication is: By what means should this traffic be sent? An originator or drafter tentatively selects the method of communication according to his general knowledge, then the message.

In every situation, a drafted message must be released before transmission. The logistics message previously referred to was released by the CO before transmission. The OTC's tactical message was released by the OTC himself, because he personally transmits it. The OTC's staff operations or communication officer could have sent the message, but only if released by the OTC. Certain R/T circuits in CIC, commanding officer's tactical plot (COTP), flag plot, and radio central are operated by designated officer or enlisted personnel with delegated authority to release immediately specific traffic.

Besides the foregoing requirements, a message must be received by the transmitting operator in the form in which it is to be sent. If an abbreviated plaindress message is to be sent by flaghoist, for instance, the visual supervisor must always be given the message as it is to be sent. This requirement means that the drafter must look up in ATP 1, Vol. II or Pub. 102 the text to be transmitted. He also must indicate to whom this text is to be transmitted and info addees, if any. After a message is properly drafted and released, it may be sent.

The signal officer often assists the originator or drafter in the makeup of a message or signal. When the signal officer is not available, the leading Signalman can provide this assistance. Insofar as possible, a leading Signalman should ensure that the message or signal is a proper one. The leading Signalman's considerable knowledge of the signal publications enables him to assist the originator or drafter in sending a better message or signal when he knows what the originator/drafter intends to say or to accomplish.

Once the message is drafted, method of transmission decided, all addressees listed, and precedence determined, the drafter then has the message released either by the captain or his properly designated representative. The way the message is released is how the signal or message must be sent.

After the message is drafted and released, it is then delivered to the visual station for transmission. The signal supervisor must ensure delivery and receipt by all addees without delay. If there are conditions affecting delivery, which the supervisor feels may be unknown to the drafter, he immediately notifies the drafter.

If one of the addees is no longer in visual range, for instance, the supervisor checks to see if the originator objects to radio instead of visual transmission to that addee. Transmission to the addees in visual range begins as soon as possible. Don't wait until transmission to the other addees is complete, however, before inquiring about the means of delivery to an addee who is out of visual range. Such a delay might be excessive. Nor does the supervisor ask the communication center to transmit a message without first clearing with its originator. Unknown to the supervisor, there may be reasons why radio must not be used.

Every communication sent or received by a ship must be recorded for future reference. After transmission of a message, it must be serviced, logged, and filed.

Message servicing entails proper endorsements by both operators and supervisors to establish individual responsibilities for message handling. Circumstances sometimes arise that require explanation regarding delays resulting from traffic handling. In such instances servicing endorsements afford a means for operating personnel to review circumstances that existed at the time, and supply appropriate explanations.

A review of terms common to message servicing follows.

TOD: Time of delivery is the time a transmitting station completes delivery of a message.

TOR: Time of receipt is the time a receiving station completes reception of a message.

Personal sign: Each operator and supervisor is assigned a 2-letter or more personal sign (usually his initials) for use in message endorsements. Initials cannot be employed in all instances, because of possible conflict with prosigns or channel designations and because of a requirement that no two signs can be alike within a particular station. Personal signs are never transmitted.

Abbreviations are used to denote various methods of visual communication.

FL	– Small signal searchlight.
SL	– Large signal searchlight.
BK	– Yardarm blinker.
FH	– Flaghoist.
NAN	– Nancy.
SEM	– Semaphore.
BKG	– Blinker gun.

Servicing for an outgoing message is penciled on the face of the message blank in the space provided or in the following manner. The supervisor makes crossed lines and enters the exchange of calls and routing. He also places his personal sign and the current date in the lower right corner of the method-of-delivery space. The operator enters method of delivery, time and date of delivery (TOD), and his personal sign. Example:

Calls (visual or international) and routing instructions	Method of delivery
NBDP Lplp0 NAYO DE or DE or -T- NWDW Rp6p2 Dp3p1	FL or SEM, etc.
Operator's personal sign (usually his initials)	TOD/TOR, (GMT/ DATE
RFS	1720Z/27 Sept.

For incoming messages, the receiving endorsements take the same form as for outgoing messages except TOR is used instead of TOD.

Servicing of endorsements always should be neat and legible and positioned on the message blank so as to avoid obliterating any portion of the message.

Each message must be recorded in the visual log with the following information: TOD or TOR; time of expection (TOX), if a signal; a signal, but not its meaning; method; received from; transmitted to; originator: action addee; info addee; and DTG or the letters "BT" followed by the TOR/TOD if no date-time group or time group is assigned. When a message is serviced and logged, a copy is placed in the visual station file in DTG order.

A point to remember in connection with a message, signal logs, and records–insofar as they pertain to transmission–is the time of delivery (TOD) to each addee. This phase of transmission often raises an important question–one that must be answered quickly. It can affect the safety of the ship and force. The only way to answer such questions is to maintain an accurate system of message/signal files and logs.

INCOMING MESSAGE–INTERNAL ROUTING AND DELIVERY

Once the SM of the watch receipts for an incoming message, services that message, and logs it, he still must see that it is routed properly. The following discussion is general, hence own ship's regulations must be complied with regarding this subject.

After receipt and entry of a message in the signal log, the first step is to get the message into correct form for delivery. Calls, operating signals, and so forth are broken down and expressed in plain language. The message then is routed to the captain if he is on the bridge, then the OOD, who initials it and indicates any others who should see it right away. If immediate routing is specified, a reliable messenger is given the rough draft for immediate delivery. Often the OOD designates one or two of the following as addees: captain, executive officer, operations officer, navigator, or CIC watch officer.

The messenger delivers the message to the officers indicated, obtaining their initials and time of their receipt. Next, he delivers the carbon of the message to the CWO/radio supervisor for writeup and further routing of copies. This carbon copy is retained in the communication center file. When routing is completed, the initialed smooth writeup "original" is filed in the DTG radio file. The original rough is returned to the visual supervisor who files it in the visual station file.

One situation in which this system of routing is useful is when the OTC sends his night orders by visual means. The OOD receives word right away, along with the CIC watch officer. The captain and affected officers are given the information before turning in for the night. The captain customarily incorporates the OTC's night intentions into his night orders, which are read and executed by each OOD, CIC watch officer, and signal supervisor during night watches. Often, some evolutions are "first light" affairs; advance information enables the executive officer to call officers and chiefs together, as necessary, because preparations may take most of the night.

In writing up the plan of the day for the next day, the XO may also use his copy of the OTC night intention. Prompt and accurate handling of these copies ensures the safety of the ship throughout the night, and also helps guarantee that the ship is organized properly and prepared to start the next day's evolutions smartly and effectively.

IN PORT

At anchor the message load differs somewhat from underway processing methods. As in underway situations, however, the OOD always sees incoming messages. During working hours, when all officers are aboard, these messages should also be viewed by the command duty officer (CDO). At night, with the CO, XO, and others ashore, it probably will be policy to show certain incoming messages to the CDO before the OOD sees them. Regardless of the time, the CDO should be awakened for important incoming messages, because he may be the only one on board with adequate experience to ensure proper and timely action. In some ships, showing incoming messages first to the OOD or gangway petty officer delays necessary action. After obtaining initials by the CDO, OOD, and others, the radio watch writes up the message and routes copies (as in the underway procedure). Copies are then available to the captain, XO, and others as soon as they arrive aboard next morning.

If own ship is moored in a nest with other ships and has the visual guard, the nest duty officer (NDO) (if assigned) sees the rough incoming message first. During working hours, the commodore or his staff operations officer sees it first (if addressed to the staff); otherwise, the CO of the individual ship concerned. After working hours, when the NDO has seen the rough message, it is delivered to the communication center of the ship having the radio guard. There it is written up and routed for the ship addressed. Complete delivery is made the next day.

OUTGOING MESSAGE–INTERNAL ROUTING AND DELIVERY

As soon as an outgoing message is received at the visual station, it is prepared for sending. The supervisor applies the heading, then gives the message for transmission to an operator on watch. As each addressee indicates receipt, the operator marks down the TOD by their call. When the message is sent to all addressees, the operator services it, enters necessary information in the visual log, and files the message in the outgoing visual station file. If, because of relay, difficulties occur in one of the addressees receipting for it, the message may be placed temporarily in the relay file, then when finally completed, in the visual station file.

Sometimes a message received at the visual station may not be in proper visual form. There are instances, however, when release in this form is entirely proper. One example is a multiple-address message to be transmitted by both radio and visual means. Examination of such an illustrative case follows.

Assume that own ship is in a carrier formation–one of three formations in a task force disposition. A message by the captain of own ship is released to be transmitted to several ships in own formation as well as to some in the other two formations. Visual, voice radio, and CW have been designated for transmission means. Radio transmits to the indicated CW ships, and CIC sends to certain other ships by voice. The leading Signalman of own ship receives a copy of the writeup from radio, with release indicated. From data on this copy is prepared a visual message form with heading applied but no text. The operator transmits, using the heading and the text of the copy received. When visual transmission is completed, this information is noted on both the copy received and the blank containing the heading. The latter information is inserted in the visual station file; the former, in the originator's rough (alibi) file. Radio is informed of TODs so that record of delivery can be completed in the communication center (COMMCEN) files. If own ship is also a flagship, the leading Signalman must maintain separate files for the flag.

Notwithstanding the need for ensuring that incoming traffic is routed promptly and properly aboard ship, there is a similar need for outgoing traffic. Sometimes internal routing of outgoing messages is overlooked. A classic example of this negligence is the signal supervisor on the flagship who makes sure that all addressees receive the flag's message but forgets his own ship.

All outgoing messages must receive standard handling by the supervisor. In addition to processing an outgoing message, as just described, routing is an essential step. Routing may take place either before or after transmission. Pretransmission routing is the responsibility of the drafter and must be ensured by the releasing officer. It is not the signal supervisor's responsibility. If, however, a message delivered to the supervisor appears improperly prepared and routed, he would bring the matter to the attention of the releasing officer.

After the message is transmitted, it should be delivered to radio central for writeup and routing aboard ship. The signal supervisor's responsibility is to get the message to COMMCEN without delay and into the hands of an authorized recipient. Each ship decides who normally receives visual traffic delivered to COMMCEN. Usually it is the traffic chief or radio supervisor. Once received in radio, a message should receive prompt writeup, routing, and distribution, the speed of which is determined by message precedence.

SECURITY IN INTERNAL ROUTING

The following rules should be adhered to strictly in handling and routing all internal traffic.

- Routing of messages and the location of message files must be such as to prevent the contents of any message from being divulged to any persons other than those who need to know.

- Messages both for delivery and for filing should be placed on covered boards.
- Messengers must be instructed to not allow–under any circumstances–contents of messages they are distributing to be seen by other than authorized persons.
- Unclassified messages are considered official business. As such, all copies, except those required for files, must be destroyed when no longer required by those to whom delivered. Classified messages must be accounted for and destroyed in a manner commensurate with classification, content, or special marking, as applicable.
- A list of cognizant officers should be prepared by the communication officer, approved by the commanding officer, to enable the communication watch to select the appropriate action officer for internal routing purposes.

EXTERNAL COMMUNICATIONS

External communications are accomplished by means of radiotelegraph (continuous wave), teletypewriter, radiotelephone, and facsimile systems.

RADIOTELEGRAPH

Radiotelegraph (often called CW for "continuous wave" telegraphy) is a system for transmitting messages by a radiowave. In this system an operator separates the radio wave into the dits and dahs of the Morse code by opening and closing a handkey. Radiotelegraph was in use by the Navy as early as 1903, and even today, despite the development of faster and more convenient methods of electronic communications, is one of the most reliable and trustworthy systems used by the Navy.

According to a NATO staff communicator:

> "No technical advances have eliminated the need for the manual radio operator. To date, we have no automatic method that can in size, weight, frequency economy, and simplicity compare with CW telegraphy; we have no system which will discriminate against accidental or intentional interference to the extent possible with a trained operator. There is no electronic substitute for an operator's brain. . . . Under marginal conditions the additional flexibility, simplicity, and reliability of a CW circuit may mean the difference between having and not having communications."

TELETYPEWRITER

The mental and manual actions performed by an operator in converting letters to Morse code (and vice versa) are replaced in teletypewriter by electrical and mechanical actions. To transmit a message, the operator types on a keyboard similar to that on a typewriter. As each key is pressed, a sequence of signals is transmitted. At receiving stations the signals are fed into receiving machines that type the message automatically.

Teletypewriter signals may be sent either by landline (wire) or by radio. Landline teletypewriter communication is used both by the military services and by commercial communication companies such as Western Union. Radioteletypewriter (RATT) is intended mainly to furnish high-speed automatic communication over ocean areas.

Today the chief shipboard use of RATT is for receiving fleet broadcast schedules, for which it is well suited. Radioteletypewriter can clear traffic at a rate in excess of 100 words per minute, as compared to the 17- to 29-wpm speed of the CW fleet broadcasts. Because the shipboard operator is freed from manual copying, and hundreds of ships may be receiving a single broadcast, the total saving in trained manpower is considerable.

Other shipboard uses of RATT are for communications between ships and, if the traffic load warrants, between ships and shore communication stations.

RADIOTELEPHONE

Radiotelephone (sometimes called voice radio) is one of the most useful military communication methods. Because of its directness, convenience, and ease of operation, radiotelephone is used by ships and aircraft for shortrange tactical communication. Its direct transmission of voice makes it possible for a conning officer to have in his hands a means of personal communication with the officer in tactical command (OTC) and with other ships. There is little delay while a message is prepared for transmission, and acknowledgments can be returned instantly. Radiotelephone equipment usually is operated on frequencies that are high enough to have line-of-sight characteristics; that is, the waves do not follow the curvature of the earth. This limits the usual range of radiotelephone from 20 to 25 miles. Radiotelephone procedure can be learned easily by persons with no other training in communications.

With these advantages of radiotelephone go some disadvantages. Transmission may be unreadable because of static, enemy interference, or high local noise level caused by shouts, gunfire, and bomb or shell bursts. Wave propagation characteristics of radiotelephone frequencies sometimes are freakish, and transmissions may be heard from great distances. Most radiotelephone messages are in plain language, and if information is to be kept from the enemy, users must keep their messages short, stick to proper procedures, and be careful what they say.

FACSIMILE

Facsimile (FAX) resembles television in that it is a process for transmitting pictures, charts, and other graphic information. It is unlike TV in that (1) facsimile gives the receiving station a permanent record of the transmission, but television does not; and (2) facsimile requires several minutes to transmit a picture twice the size of this page, whereas television sends a continuous stream of 30 pictures per second. Facsimile is useful for transmitting such matter as photographs and weather charts. The image to be sent is scanned by a photoelectric cell, and electrical variations in the cell output—corresponding to light and dark areas being scanned—are transmitted to the receiver. At the receiver the signal operates a recorder that reproduces the picture. Facsimile signals may be transmitted either by landline or by radio.

The most useful application of facsimile has proved to be the transmitting of fully plotted weather charts, which has eliminated the need for skilled weather analysts and duplicate plotting aboard each ship and station where weather information is required. Significant economics, as well as a more uniform, accurate, and rapid weather service have been effected.

ADDRESS DESIGNATORS

Because of a heavy load of visual traffic, when a ship operates with a task force, it may be difficult at times for the signal gang to keep abreast of rapidly changing tactical situations. An alert supervisor of the watch, nonetheless, minimizes some of these difficulties by taking appropriate steps beforehand. Learning address designators and their applications are cases in point.

Before getting underway the supervisor checks the prevailing OpOrder to familiarize himself with the organization of the task force. He then obtains all of the calls he will need from the communication section of the OpPlan and prepares a list of various address designators likely to be used. These lists are posted at the signal station for ready reference. A typical list includes calls for the task force, task group, and task unit. If the tactical situation requires the ship to shift to another task unit at a certain time or upon completion of a certain evolution, this change and any new calls for the new task unit are also posted at the signal station.

ADDRESS GROUPS

Address groups are four-letter groups assigned to represent one or more commands, activities, units, or geographic location. They are used primarily in the message address, although, in military communication, they can be employed in the same manner as call signs to establish and maintain communication. In general, call signs and address groups are used by the Navy the same way. Address groups never start with the letter N, hence they are easily distinguished from naval radio call signs. Unlike international call signs, address groups follow no distinctive pattern. Arrangement of the four letters in address groups conveys no significance whatsoever.

The commands afloat (besides individual ships) are assigned address groups. They are also assigned to shore-based commands, authorities, or activities not served by their own communication facilities, such as (1) senior commands and commanders ashore, the Secretaries of Defense and of the Navy, bureaus and offices of the Navy Department, and district commandants; (2) fleet, type, or force commanders ashore; (3) elements of operating forces permanently ashore who are in frequent communication with forces afloat; and (4) elements of the shore establishment (such as weather centrals) having a need for direct addressing and receipt of messages.

Among other uses, address groups facilitate delivery of messages in instances where a communication center serves so many activities that its own call sign is not enough to identify the addressee.

So many address groups presently are assigned that all cannot be contained in one publication. Address groups for the United States and allied countries are listed in ACP 100 and in ACP 100 U.S. Supplement No. 1.

Address groups, like call signs, are divided into types. These groups are listed as follows.

1. Individual activity address groups represent a single command or unit, either afloat or ashore. Examples:

DTCI	COMPHIBLANT.
SSMW	CNO.

2. Collective address groups represent two or more commands, authorities, activities, units, or combinations. A group includes the commander and his subordinate commanders. Example:

DSWN	DESRON 16.
AMGK	SIXTHFLT.

3. Conjunctive address groups are used only with one or more other address groups. When alone they have an incomplete meaning. To complete the meaning, it is necessary to add other address groups denoting a specific command or location. For example, the conjunctive address group XZKW means "All ships present at ______________." This particular group must be followed by a geographic address group.

4. Geographic address groups represent a geographic location or area. They must always be preceded by a conjunctive address group. Assuming the geographic address group for Newport, R. I., to be DEXL, and using the conjunctive address group from the previous example, the address for "All ships present at Newport, R. I." would be XZKW DEXL.

5. Address indicating groups (AIGs) represent a specific set of action and/or information addressees. The originator may or may not be included. Purpose of AIGs is to increase the speed of traffic handling. They shorten the message address by providing a single address group to represent a number of addressees, thus eliminating individual designators for each addressee. For example, BIOQ is an AIG used to address air defense messages originated by COMEASTSEAFRON to 24 action addressees and 37 information addressees. In this example 61 call signs and address groups are eliminated from the message heading by using one AIG.

6. Special Operating Groups comprised of four letters and identical in appearance with address groups, are provided for use in the headings of messages to give special instructions. They are not to be used until a Nation or Service has promulgated instructions authorizing their use. They must always be encrypted. They may be used singly, or with encrypted or unencrypted call signs or address groups.

EUBJ	Pass to the first addressee.

ROUTING INDICATORS

A routing indicator is a group of letters that identifies a station in a teletypewriter tape relay network. Routing indicators vary in length from 4 to 7 letters, depending upon type of station. It is easy to distinguish routing indicators from call signs or address groups because routing indicators always begin with either letter R or U. Routing indicators are never encrypted, and they are never used in visual communications.

PLAIN LANGUAGE ADDRESS DESIGNATORS

Plain language address designators are the official, abbreviated, or short titles of commands or activities, used instead of call signs or address groups in the headings of messages. Some abbreviated titles are written as single words; others have conjunctive titles and geographical locations. Examples: CNO, NAVCOMMSTA-GUAM.

Plain language address designators are widely used in unclassified messages originated and addressed within the shore establishment. They are also used in communications with the Army, Air Force, and the allied armed forces. They do not appear in headings of codress messages, or in messages originated by or addressed to U.S. Naval forces afloat, except as authorized in article 5050 or DNC 5.

VARIANTS

A variant is an additional call sign or address group assigned to a command for encryption purposes. Not all ships and commands are assigned variants. In general, variants are assigned to all the larger ships and activities.

Variants are never transmitted unencrypted. When call sign and address group encryption plans are in effect, both basic calls and variants are encrypted. If a ship or command is not assigned variants, the basic call sign or address group is not encrypted.

Encode sections of the call sign book list call signs and address groups in two columns. Variants, when listed in column 2, are the only call signs to be used for deriving both encrypted and unencrypted voice call signs for military communications.

USE OF STATION AND ADDRESS DESIGNATORS

Call signs and address groups, besides use in calling, addressing, routing, and delivery, have two other functions. One function is as a brevity code of a limited security value, and the other as a means of affording security of address. In the first, they may be used on both plain text and encrypted messages where security of address is not required. In the second, where security of address is required, call signs and address groups may be made secure by planning rotation either through call sign encryption systems or by reshuffling basic assignments at periodic intervals. (Full details are given in ACP 121.)

Call signs, address groups, and plain language designators may be used in transmission instructions (with operating signals, for example), and in the address component of either encrypted or unencrypted messages.

Unencrypted call signs and address groups may be mixed with encrypted call signs and address groups in the same message heading, provided encrypted call signs or address groups are identified in accordance with instructions in ACP 121.

USE OF PLAIN LANGUAGE STATION AND ADDRESS DESIGNATORS

Plain language designators are not authorized in lieu of call signs, address groups, or routing indicators in establishing and maintaining communications. Use of plain language in the address component of encrypted messages is based upon security implication. Plain language designators cannot be used in conjunction with call signs or address groups. Plain language is authorized for use only in addressing communications under the following circumstances:

1. With unencrypted messages, when so directed by one of the armed services or allied authority, when call signs and address groups are available.
2. With unencrypted messages when call signs or address groups are not available.
3. With encrypted messages that must be filed by nonmilitary means.
4. On certain local voice-radio harbor circuits, as directed by SOPA.

Use of plain language address designators in headings of encrypted messages of codress format is prohibited except when nonmilitary refile is required. If necessary to refile a codress message to one or more addressees by nonmilitary means, the plain language designator(s) of only those addressee(s) that must be served by the nonmilitary agency should appear in the message heading. The plain language designator of the station filing the message must be shown as the message signature, if required by the commercial company's rules.

Unless required by appropriate directives, plain language geographic place names must be transmitted in an address designator only when necessary to complete titles of addressees or originators. Plain language geographic place names must never be used in connection with names of naval or merchant ships or titles of commands afloat.

USE OF CALL SIGNS

Call signs are employed primarily for establishing and maintaining communications. Call signs may also serve as address designators when the call sign indicates the addressee. As a general rule, use of call signs in message texts should be avoided. Indefinite call signs are used by warships and merchant vessels when transmitting codress messages or other messages requiring security of origination to shore radio stations. Indefinite call signs are also utilized when transmitting via broadcast method to ships at sea. Tactical call signs, with the exception of task organization and aircraft tactical call signs, have limited application. They should not be used outside their normal area of application unless the command assigned such call signs notifies all interested commands in advance.

USE OF ADDRESS GROUPS AND SPECIAL OPERATING GROUPS

Address groups are chiefly for addressing communications. In military communications, however, address groups may be used in some instances as call signs for establishing and maintaining communications (by naval commands afloat, for instance). In nonmilitary communication, where use of address groups is obviously inappropriate, either internationally recognized call signs or appropriate plain language address designators should be used. Use of address groups in message texts should be avoided except in procedure and service messages. In utilizing conjunctive address groups, care must be exercised to ensure that the meaning is completed by addition of the appropriate address group denoting a specific command or location.

Geographic address groups should be included as a part of an address designator only when necessary to complete titles of addressees or originators, then they are used in combination with a conjunctive address group. Geographic address groups should not be used with names of naval or merchant ships or titles of commands afloat, except where a conjunctive geographical address group is specified in the basic address group assigned.

An address indicating group (AIG) is a form of military address designator representing a predetermined list of specific and frequently recurring combinations of action and/or information military addressees. Identity of the originator may also be included if the AIG is addressed frequently by any one originator. Each AIG is numbered for ease of identification. An address group is assigned to each AIG to serve as an address designator. When appropriate, AIG numbers may also be used as plain language address designators.

Purpose of AIGs is to increase speed of traffic handling and reduce the length of the address component. Address indicating groups can be employed whenever suitable, whether the message concerned is unclassified or classified, unencrypted or encrypted, or in plaindress or codress form.

To give special instructions, special operating groups of four letters, identical in appearance to address groups, are provided for use in headings of messages. They are not to be used until a nation or service promulgates authorizing instructions. They must always be encrypted, and they may be used singly or with other encrypted or uncrypted call signs or address groups.

ENCRYPTED ADDRESS DESIGNATORS

As determined by prevailing circumstances, and when so ordered, call signs and/or address groups must be encrypted. This process may be for exercise purposes or as a security measure. Circumstances surrounding the need to encrypt are varied and are beyond the scope of this text. When address designators are encrypted, however, current orders should so indicate.

Once own ship receives an order indicating the encryption to use, it may be too late to commence training personnel on the subject. The leading Signalman must find out through communication and operations officers which encryptions are likely to be used and, through training and other preparation, be ready when the occasion arises. Difficulty with address designator encryption results in inefficient message processing, which must be avoided at all costs. A good source of material applicable to own visual station is ACP 121. The following publications also contain pertinent information.

ACP 110, Allied Tactical Call Sign Book (CONFIDENTIAL)
ACP 112, Task Organization Call Sign Book (CONFIDENTIAL)
ACP 113, Call Sign Book For Ships (CONFIDENTIAL)
ACP 117, Allied Routing Indicator Book (UNCLASSIFIED) (U.S. Supp-4 to ACP 117 is CONFIDENTIAL)
ACP 129, Communications Instructions Visual Signaling Procedures (UNCLASSIFIED)
ACP 147, Call Sign Book for Merchant Ships in Time of War (CONFIDENTIAL)
ACP 148, Wartime Instructions for Merchant Ships (Visual Signaling and Tactics) (CONFIDENTIAL)
ACP 150, Recognition and Identification Instructions–Air, Land and Sea Forces (CONFIDENTIAL)
JANAP 119, Voice Call Sign Book (CONFIDENTIAL)

Additional books containing call signs for aircraft, tactical call signs for use in the field, and voice call signs, are issued by DNC. A table showing international allocation of initial letters of signal letters, call signs, and aircraft markings is contained in Pub. No. 102.

CONCLUSION

Information completing this discussion of station and address designators is included to give the leading Signalman a broad view of the subject. It must be understood, however, that coverage in this chapter is only a beginning. Ability to use address designator publications with facility is a skill that the leading SM must develop.

Any communicator (including Signalmen) must rapidly and efficiently associate station and address designators with their source publication. Until this skill is developed there is no guarantee of reliability, speed, and security required of a leading Signalman for processing messages.

CHAPTER 4

CONVOY COMMUNICATIONS

Although now generally accepted, convoys were once the subject of bitter but sincere arguments by professional seamen, many of whom felt that concentrating targets in one area merely made it easier for the enemy. Statistics prove the worth of the convoy system of ocean transit and, in the event of future wars, resort to their use again– although probably modified somewhat because of nuclear warfare capabilities–seems inevitable.

When many ships steam in company, communication problems are difficult. In a convoy the predicament is even more extreme because merchant vessels as well as naval vessels are involved. One must remember that a Navyman spends most of his years at sea steaming in company with other ships, whereas a merchant marineman, during peacetime, is steaming independently almost constantly. Communications are further complicated by the language barrier. Convoys usually are made up of ships of many nations, traveling in company for mutual safety but manned by people who speak in different tongues. To be able to solve the problems, one must first understand the basic characteristics of convoys. A start is made by discussing peacetime merchant ship communication systems.

PEACETIME MERCHANT SHIP COMMUNICATIONS

The naval communication network is vast, complicated, and expensive. No privately owned shipping company could afford to support such a network or, for that matter, have need for such extensive facilities. Yet, need for rapid communications between masters and shipowners is apparent. In the same way that corporations and individuals ashore obtain access to rapid communication facilities by subscribing to commercial telegraph and telephone companies, merchant shipping companies contract with radio service companies. There are a number of such companies, but the majority of U. S. flag vessels subscribe to one of four. They are RCA Global Communications, Inc. (RCA); Mackay Radio and Telegraph Company (MRT); Globe Wireless; and Tropical Radio Telegraph Company (TRT).

The four radio service companies have shore stations located throughout the areas of the world served by them. They have contracts with other radio companies in foreign lands, enabling a merchant ship to remain in communication with its company office. As a ship steams about the oceans, it always has available–depending on atmospheric conditions–a shore-based communication facility to which its messages may be sent. Once a message is received ashore, it is retransmitted through the radios and landlines of the radio service company and its affiliates until it reaches its ultimate destination. Messages to the ship are handled in much the same way.

Communication procedures practiced by merchant ships, regardless of nationality, are comparatively similar to U.S. Navy procedure but less formal, chiefly because of language differences. Operating (Q) signals have extensive application in merchant ship communications. The Q signals are international in the sense that they have the same meaning in any language, enabling radio operators of different nationalities to talk among themselves. (Both operating Z signals and appropriate Q signals are contained in ACP 131.) Normally, the receipt method of communicating is used, both transmitting and receiving stations being required to use their transmitters. Such a system obviously is reliable, but is unsafe in wartime.

MERCHANT SHIP BROADCAST

The MERCAST (broadcast to merchant ships) system is used for delivering official messages originated by Government agencies and addressed to merchant ships. Personal messages are filed with a commercial carrier.

Under the MERCAST system, a number of naval shore radio transmitting stations are assigned areas of broadcast responsibility. In peacetime, these areas conform closely to fleet broadcast areas. (See fig. 4-1.) In time of war, when the Navy may have control over U.S. flag merchant ships, broadcast areas are augmented to provide both worldwide and local-area coverage through the use of MERCAST coastal stations.

Area stations broadcast at scheduled periods simultaneously on one medium frequency and one or more high frequencies. This broadcast method ensures that each ship in the area can copy the schedule on whichever frequency is most favorable, taking into account atmospheric conditions and the time of day. Transmission of traffic commences precisely at the scheduled time and continues within scheduled limits until all traffic is cleared. During the international silent periods (from 15 to 18 minutes and from 45 to 48 minutes past each hour, reserved for listening for distress signals) the MERCAST schedule is interrupted so that ships may shift to 500 kc (international distress frequency).

The initial part of each MERCAST transmission includes a preliminary callup, a traffic list consisting of radio call signs of ships to which messages are addressed, and the DTG of each message. All ships at sea are required to copy the traffic list. A ship (except a MERCAST guardship) for which no traffic is scheduled is not required to copy the remainder of the broadcast and reverts immediately to the normal guard of 500kc. Messages ordinarily are transmitted at a speed no greater than 18 words per minute, and normally they are sent only once. Flash and Immediate precedence messages, however, are transmitted on each of two consecutive schedules. Unless specific instructions to the contrary are contained in the text of a message, ships must not break radio silence to respond to, or in any way acknowledge, MERCAST traffic. Except for MERCAST, messages for an individual ship in a convoy usually are addressed to the escort force commander, with instructions to pass to the ship concerned.

Merchant ship general messages are transmitted on MERCAST by means of collective call signs in the traffic list. All merchant ships under Allied control must copy these messages and maintain them until they are canceled or superseded.

Sailing orders received by each ship before sailing include instructions on the date and time to shift from one area MERCAST broadcast to another. Usually, time is such that no difficulty is experienced in copying appropriate broadcasts. When convoys or independents are diverted, the operational control authority (OCA) must include instructions amending the time(s) of shift.

INTRACONVOY COMMUNICATIONS

The remainder of this chapter deals mainly with communications within a convoy. It might be beneficial, however, to first mention some important aspects of convoy communications in general. The term "convoy communications," of course, implies a state of national emergency or wartime conditions.

The CW frequency common to all ships in a convoy is 500 kc. The voice radiotelephone frequency common to all ships in a convoy, and between the convoy and the escort, is determined before sailing and is stipulated in the convoy communication plan.

Safety from enemy attack at sea demands radio silence by all ships of the convoy. Except in the most unusual circumstances, all traffic destined for addressees outside an escorted convoy is transmitted via the escort force commander. If it is necessary—and authorized—for a merchant ship to make direct radio contact with units beyond the convoy or with shore stations, transmissions are on 500 kc, if possible. Otherwise, they are on other frequencies specified in the radio section of the convoy communication plan.

Except in certain well-defined instances, then, transmission by radio is forbidden. Included in the exceptions are contact reports, distress messages, messages in accordance with a special order from some naval or military command, and whenever, in the opinion of the master or

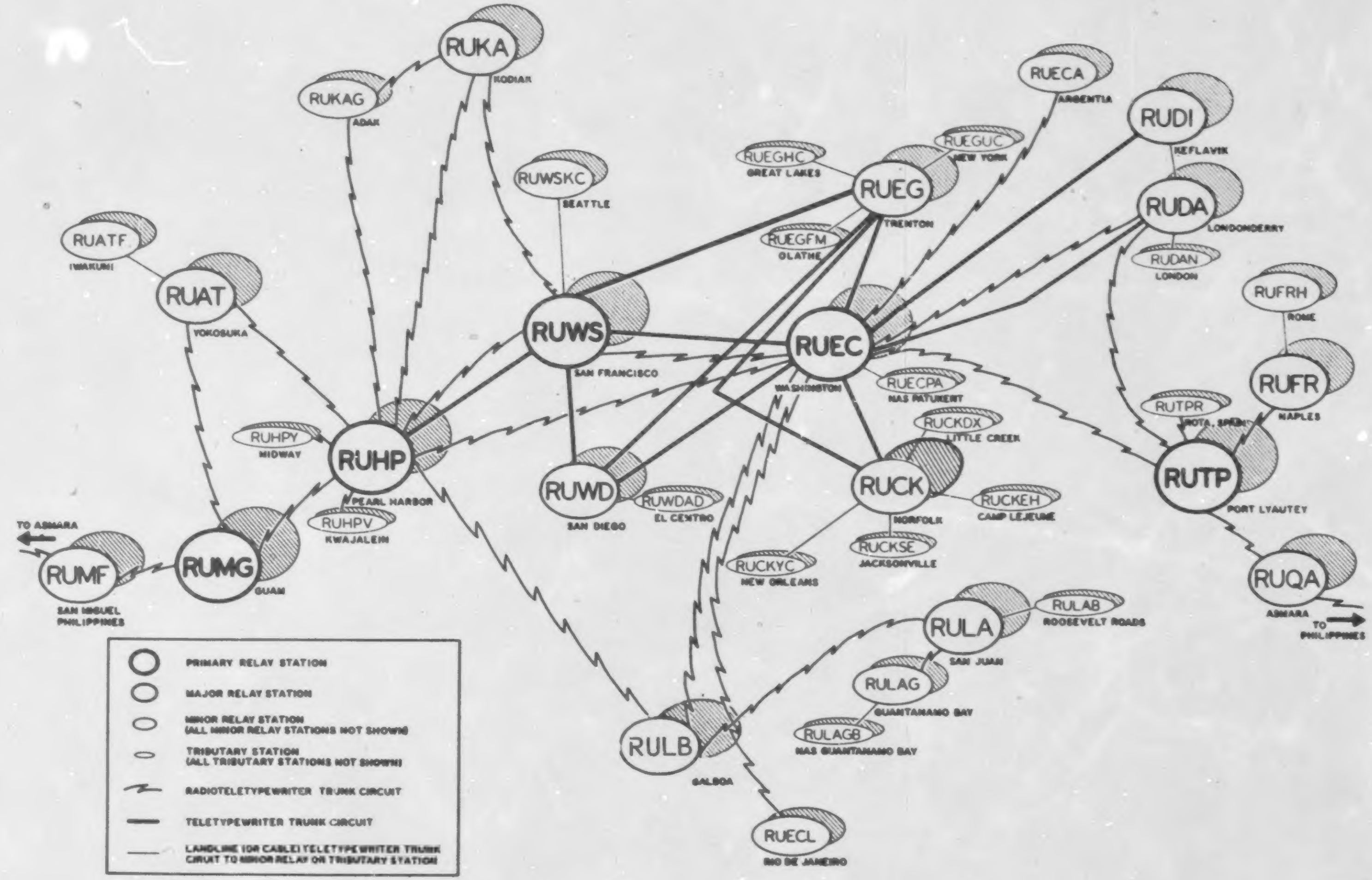

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Figure 4-1.—Routing indicators used in the naval teletypewriter and tape relay network.

the convoy commodore, the necessity for breaking radio silence outweighs the risk of disclosing a ship's position. It should be borne in mind that use of a radio transmitter endangers all other ships present. Enemy activities and units equipped with direction-finding (DF) receivers can take a bearing on a transmission of very short duration. Two such bearings allow an accurate determination of a transmitting ship's position to be obtained.

To maintain communication discipline, the ship in which the convoy commodore is sailing is usually designated as transmitter ship for the convoy. If a ship in the convoy has a requirement to send a message, the text is transmitted to the convoy commodore by visual means, if feasible, or by VHF/UHF radiotelephone if the ships are equipped properly. The commodore, provided he concurs that the message is of sufficient importance, arranges for the escort force commander to send the message via Navy channels. In the absence of an escort force commander, only the commodore has authority to break radio silence except in those instances cited previously.

When it becomes essential to break radio silence and transmit a message, UHF, VHF, HF, or LF, respectively, should be used to reduce probability of detection. Even high frequencies, however, can be detected by proper equipment; therefore lengthy transmissions should be avoided. Transmissions of contact reports and distress messages always should be made initially on 500 kc to ensure receipt by ships in the vicinity. Maintenance of radio silence is meaningless within visual range of the enemy.

All messages transmitted at sea are sent encrypted unless they are contact reports, distress messages, or messages of similar extreme urgency. In order to have sufficient personnel available to process coded traffic, a selected number of reliable ship's personnel, cleared to handle the requisite degree of classified material, should be trained in encryption and decryption procedures.

The master is personally responsible for the custody and safeguarding of all classified documents and all cryptographic material, publications, and files. They may be kept by the senior radio officer at sea and must be kept by the master in port. When not in use, they must be retained in a safe or under strong lock and key. These materials have first priority if emergency destruction of classified material becomes necessary. They should be burned, if possible. In deep water, they may be thrown overboard in a weighted and perforated metal box, one of which is kept on the bridge and one in the radio room.

Use of private ship or company codes is expressly forbidden to ships sailing under the naval control of shipping organization (NCSORG).

NAVAL CONTROL OF MERCHANT SHIPPING

In time of peace, merchant ship owners and operators direct and control the movement of their ships at sea. During periods of mounting tension, preliminary preparations will be taken by national governments for eventual assumption of control of national flag merchant shipping in the event of war or proclamation of national emergency. In such event, the National Naval Control of Shipping Organization (NCSORG) will be activated and national merchant ship movements will come under its control. This national naval control of shipping organization will also function as part of the Allied Naval Control of Shipping Organization.

Civil Direction of Shipping Organization (CDSORG)

In the event of a national emergency proclamation or outbreak of war, the Civil Direction of Shipping Organization (CDSORG) will assume custody and control of all national flag merchant shipping; and will be responsible for all matters related to the employment and operation of merchant ships, i.e., allocation to employment, voyage itinerary, loading and discharging, maintenance and repair, conversion, manning, storing and supplying, harbor movements, etc. These operations are similar to those performed by the owners in peacetime, but in time of war the national effort is directed to fulfilling the Alliances' requirements for ocean transport in the prosecution of the war.

Naval Control of Shipping Organization (NCSORG)

The Naval Control of Shipping Organization (NCSORG), in the time of war or national emergency, exercises authority for the control and direction of actual merchant ship movements. The NCSORG is composed of naval control of shipping offices (national and allied) established in most primary and secondary ports throughout the world. It is through these offices that the direction and control of merchant ship movements is effected. The control of ship movements includes convoy organization, convoy routing, independent ship routing, movement reporting, tactical diversions, etc. When allied naval control of shipping is implemented, the function becomes the responsibility of designated allied naval commanders referred to as Operational Control Authorities (OCAs) to whom the NCS officers report for the maintenance of coordinated control of ship movements.

Operational Control Authority (OCA)

The Operational Control Authority (OCA) is the naval commander responsible for the control of the movements and the protection of Allied merchant ships within a specified geographical limit. Within their area of responsibility the OCAs are required to:

a. Maintain adequate systems of communication, intelligence and plotting to ensure rapid and secure dissemination of operational information.

b. Sail ships in convoy or as independents in accordance with the policies in force.

c. Coordinate the control of shipping movements with contiguous naval commands.

d. Provide the protection in port and at sea for merchant ships under their control.

e. Maintain operational control of the Naval Control of Shipping Offices (NCSOs) and Reporting Offices (ROs) within their commands.

Naval Control of Shipping Instructions to Merchant Ships

When Naval Control of Shipping is ordered by any nation, ships of that nation will be controlled by the NCSORG, which may then issue instructions to ships on the following matters:

1. Date and time of departure.
2. Route to be followed.
3. Speed.
4. Regulation regarding dimming or extinction of lights.
5. Anti-sabotage precautions.
6. Communication at sea:
    a. Visual
    b. Radio (Watches and regulations regarding radio and other silences).
7. Manning and operation of armament.
8. Rescue operations
9. Diversions
10. Evasions
11. Convoy regulations

The Naval Control of Shipping Officer (NCSO) is the naval officer who controls and coordinates the routing and movement of merchant ship convoys and merchant ships moving independently out of his assigned port or adjacent ports for which he is responsible. The NCSO deals indirectly with the ships' masters from the time the master reports for routing and departs to a convoy anchorage to await inclusion in a convoy or, if an independent, the ship leaves the harbor for its next port of destination. The NCSO's operational duties cover such factors as briefing the masters, obtaining and checking data and information preparatory to routing the vessel, sighting and correcting registered publications, establishing the vessel's convoy eligibility, inspecting communication equipment, arranging for issuance of required hydrographic charts and publications, assisting the master with local operating problems, issuance of naval sailing permits and sailing orders, notifying masters as to the date and time of convoy conferences, holding convoy communications conferences and convoy presail conferences, instructing masters and radio officers regarding convoy communication procedures and the use of crypto systems, arranging for local pilots to affect the sortie plans, arranging for convoy anchorage berths, plus many other matters relating to routing and movement of vessels. Consular authorities, or other assigned agents will perform NCSO functions at those ports that do not have an NCSO assigned. Hereafter, whenever the term

NCSO is used it is intended to include such authorities.

Communication Plan

An important part of the sailing orders and instructions provided by the NCSO is the communication plan. Basic radio communication organization and procedures for all ships, sailing independently or in convoy, upon which the radio communication plan will be based, are found in ACP 149 (Radio Communications Instructions for Merchant Ships Under Naval Control) and Appendix (A) of ACP 148B.

Naval Communication Liaison Personnel

Some nations will assign naval communication personnel to valuable ships or ships carrying vital cargoes. In this event, their orders and the command relationships between the Master, Ship's officers and naval personnel will be laid down by national authority.

Convoy Naval Communication Staff

A convoy naval communication staff will normally be assigned for duty with all convoy Commodores. Naval communication personnel may also be assigned to Vice and Rear Commodores. The commodore's communication staff is responsible, through its senior officer or man, to the Commodore and will carry out duties as ordered by him. It is important that the naval staff work in close cooperation and liaison with the radio officers of the Commodore's ship in the performance of their duties.

Change in Operational Control (CHOP)

In the course of one voyage, a ship may traverse two or more operational areas. When this occurs, each OCA involved is given full information by means of a system of ship movement reporting based upon messages originated by the NCSOs. This information includes the time when the ship is expected to cross the line between operational control areas. At this time, a ship changes operational control and is said to CHOP to the new OCA. At the same time a SHIFT in radio guard may take place. The CHOP and SHIFT times are laid down in the sailing orders to enable the new OCA to communicate with the ship through his area communications.

CONVOY ORGANIZATION AND BASIC MANEUVERING INSTRUCTIONS

Convoy operation is an art. The safe passage of a convoy depends on the following factors:

1. The organization of the convoy by a shore authority.
2. The management and control of the convoy at sea.
3. The skillful handling of each ship while in convoy.

The fundamentals of convoy operation must be understood by every master and watchkeeping officer so that each ship can play her individual part.

COMMAND AND RESPONSIBILITIES IN CONVOY

THE OFFICER IN TACTICAL COMMAND (OTC).—The OTC is the senior naval officer present or the officer to whom he has delegated command. The OTC is responsible for the defense of the convoy and the enforcement of such instructions and orders as are related to the defense of the convoy. Emergency turns and evasive alterations of course by the convoy, when the situation requires, are ordered by the OTC after consultation with the convoy commodore, if practicable, and are executed upon signal from the convoy commodore's flagship. He has authority over the Convoy Commodore.

CONVOY COMMODORE.—The convoy commodore is the officer, naval or merchant, designated by naval authority to command the convoy, subject to orders of the OTC. In the absence of an escort he takes entire command.

1. The convoy commodore is responsible for the internal operations of the convoy, including the assignment of stations to ships in the convoy after leaving harbor, the issuance of instructions

and regulations for the convoy, the safe navigation of the convoy as a whole, and for the communication organization of the convoy within the policy of the OTC. He should consult with the OTC, whose navigational facilities are normally superior to his, regarding safe navigation, particularly in channels and mineable waters. Under normal conditions the convoy commodore will control the convoy tactically in accordance with standard instructions for convoys and such additional instructions as he may receive from competent authority. He is also responsible for the readiness for action and conduct in action of the merchant ships under his command. If the commodore of the convoy is incapacitated or forced to relinquish command of the convoy his duties are assumed by the vice or, failing him, the rear commodore.

2. When required to make good a specified course or to follow a specified route he is to be particularly careful that due allowance is made for wind and tide, that the guide of the convoy steers an accurate course and that the remaining ships maintain their ordered stations.

3. When on arrival in narrow waters, or for any other reason, it becomes no longer practicable for a commodore to exercise control of the convoy, he must order the convoy to proceed independently so that masters will know that they should no longer look to him for guidance.

4. Although the commodore is responsible for the safe conduct and information of the convoy, masters, individually, are at all times responsible for the safe navigation and handling of their ships.

VICE AND REAR COMMODORES.–The vice and rear commodores are officers, naval or merchant, designated by naval authority to succeed respectively to command of the convoy in the event the convoy commodore (or his flagship) is incapacitated. In this event, vice and rear commodores shall assume responsibilities of a convoy commodore.

MASTERS ACTING AS COMMODORE.–A master detailed to act as convoy commodore is to carry out the instructions, orders and responsibilities of a convoy commodore.

RESPONSIBILITY BETWEEN COMMODORE AND MASTER OF COMMODORE'S SHIP.–The commodore normally sails in one of the merchant ships of the convoy. Should the master of the commodore's ship consider that for any reason the safety of his ship is being endangered unduly, he is to inform the commodore accordingly. The master is responsible for the navigation and handling of his own ship but is not responsible for the convoy as a whole, except in a case where the master has been assigned the additional duty as convoy commodore.

DISTINGUISHING FLAGS FOR COMMODORES.–A large flag XRAY is to be flown by the commodore's ship while the convoy is forming up or reforming or whenever the commodore wishes to make his ship readily identifiable. It is flown on similar occasions by the vice or rear commodore's ship when such officer has assumed command of the convoy or is acting independently of the commodore when in charge of some portion of the convoy.

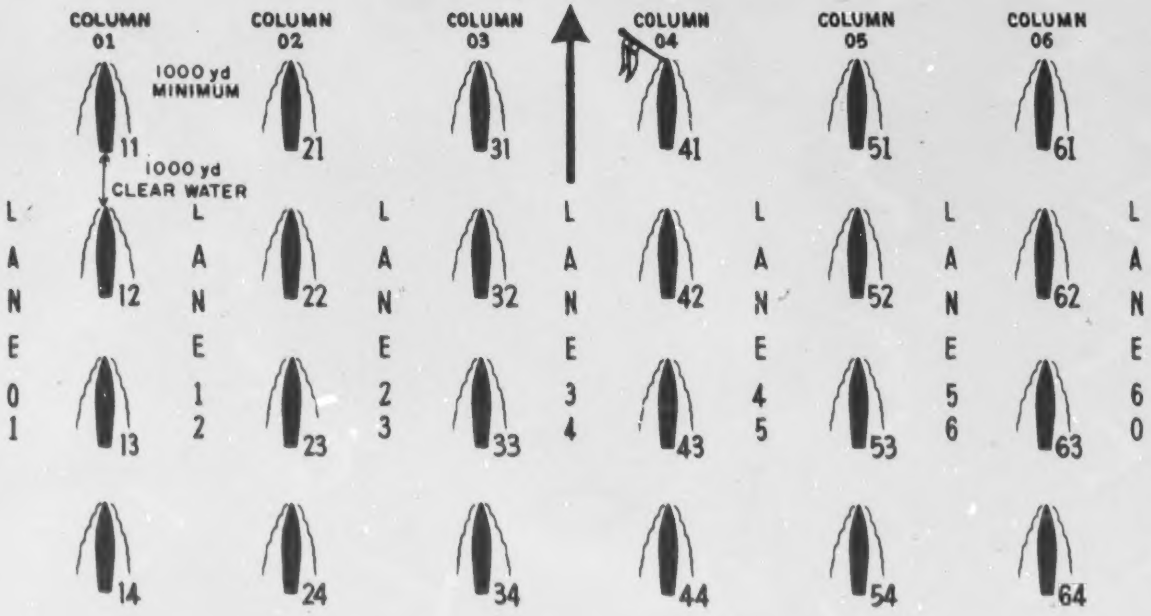
CONVOY FORMATION.–The arrangement of ships in a convoy is termed the "Convoy Formation". The usual convoy formation consists of several columns of ships with the leading ships of each column abreast of one another. In this formation, the ships in column are said to be in "line ahead" (see figure 4-2).

LIGHT REPEATING SHIPS.–If the convoy is large, special light repeating ships may be designated to relay messages from the commodore.

Guides of a Convoy

One ship in formation will be designated as the convoy guide. It is the duty of the guide to maintain accurately the course and speed ordered. If ships are in a single column, the leading ship will be the guide. If, for any reason, the leading ship falls out of line, the ship next astern of her becomes the guide of the column.

If there are two or more columns in a convoy, one of the column guides must also act as convoy guide. The convoy guide must maintain



37.41

Figure 4-2.—Course of the convoy.

the course and speed ordered, and guides of columns must keep their correct station on her. Ships in each column are to keep station on the guides of their respective columns.

The commodore's ship normally acts as convoy guide but the commodore may wish some other ship to take over this duty. The ship so ordered is immediately to hoist her largest merchant ensign at the masthead and keep it flying so long as she remains convoy guide.

If the commodore has detailed some other ship to act as convoy guide and later wishes to make a further change he will make a signal indicating which ship is to become convoy guide. When this signal is executed, the ship that has been acting as guide is to haul down her merchant ensign and cease to act as guide. At the same time, the new guide is to hoist her largest merchant ensign at the masthead and become the guide. If it is the commodore's flagship, execution of the signal will indicate that the commodore has reassumed the guide.

Should the convoy guide be torpedoed or, for some other reason, be unable to act as guide, the leading ship of the next column to starboard is immediately to become convoy guide without further orders. If there is no column to starboard of the crippled guide, the leading ship of the next column to port is to become the guide. A ship becoming convoy guide is immediately to hoist her largest merchant ensign.

The convoy guide and column guides remain the same if the convoy alters course by any of the following methods:

1. By all ships turning simultaneously less than 90 degrees to starboard or port.
2. By wheeling (altering course in succession).
3. By column leaders turning simultaneously the remainder in succession.

In order to assist station-keeping in a convoy, the convoy guide is to change automatically when all ships turn simultaneously through 90 degrees or more.

1. If the convoy alters course, with all ships turning simultaneously exactly 90 degrees to starboard or port, forming lines abreast, the port

or starboard wing ship respectively of the new leading line abreast automatically becomes the convoy guide and, without further orders, is to hoist her largest merchant ensign. The previous guides of column, however, do not change but become guides in line abreast. In figure 4-2, if ships turn together 90 degrees to starboard, No. 61 automatically becomes convoy guide, but Nos. 11, 21, 31, 41, 51 and 61 remain guides of the respective lines abreast of which they are a part.

2. If the convoy alters course, with all ships turning more than 90 degrees, the ship now leading the column originally led by the convoy guide is automatically to become the new convoy guide, and the ships now leading the columns become the new guides of their respective columns. Thus, in figure 4-2 if ships turn together more than 90 degrees, No. 44 automatically becomes the convoy guide, and Nos. 14, 24, 34, 44, 54 and 64 become the new guides of their respective columns.

When a convoy is in wide spacing it may be desirable for the convoy commodore to designate certain ships as group guides. Such ships are to take charge of their groups in case of emergency or doubt and if necessary act on their own initiative.

GENERAL COMMUNICATIONS INSTRUCTIONS

The following types of communications are available. Further instructions for the use of the means of communications will be given at the convoy conference:

1. Internal (convoy)
   a. Primary means
      1 Radiotelephony (VHF or HF voice)
   b. Secondary means
      1 Flaghoist (by day)
      2 Colored lights (by night)
      3 Flashing light
      4 Radiotelegraphy
2. External (ship/shore)
   a. Radioteletype (if fitted)
   b. Radiotelegraphy
   c. Radiotelephony

Signals Used in Convoy

Ships in convoy shall use the signals provided in INTERCO, Appendix (A) to ACP 148, and "Q" Codes. These signals may be transmitted by voice radio, subject to the radio policy in force as well as by visual means. Signals not found in the international Code of Signals (ICOS) or the "Q" Codes, are taken from Appendix (A) of ACP 148B.

1. All groups starting with X and consisting of three letters are taken from Appendix (A) of ACP 148B.
2. Single pennant signals are found in Appendix (A).
3. F, T, and W followed by three numerals are found in Appendix (A).
4. In convoy, flags E, I, Y, and Z are taken from Appendix (A) and have a different meaning from the ICOS.
5. Warships will and merchant ships may hoist the 4th substitute when taking signals for Appendix (A).

Certain signals require simultaneous execution. The method of signaling simultaneous execution is contained in Appendix (A).

Time Use in Signals

GMT is to be used in all communications. The clock in the radio office and a clock on the bridge are to be set to GMT and so labeled.

Classified Recognition Signals

The classified recognition signals which are supplied by the naval authorities before sailing must be examined and the signals of the current period must be given to the officer of the watch. Ships must identify themselves promptly when challenged by allied warships, aircraft, examination ships or Harbor Entrance Control Port/Port War Signal Station (HECP/PWSS).

Convoy Flag

The NCSO at the port of departure of a convoy (or main section of a convoy) will assign a distinguishing flag to be flown by all ships and escorts in any one particular convoy. This flag will have a purely local and temporary significance, and its purpose is to assist mutual recognition of the convoy when leaving harbor, when forming up and when sections are joining. It may also be used when different convoys are in close proximity at sea.

Approaching Examination Anchorages at Night in Convoy

Merchant ships in convoy may be directed to show two red lights arranged horizontally, until the examining officer orders them turned off. Necessary orders to the convoy must be given by the escorting ships.

Examination Ships

Examination ships are distinguished by the following means:

BY DAY.–The examination flag flying at the foretruck (dimensions and colors are shown in figure 4-3). In addition, when the port is closed they will hoist three red balls six feet apart vertically at the yardarm.

BY NIGHT.–Three lights vertically six feet apart conspicuously displayed at the yardarm so as to show an unbroken light around the horizon. When the port is open these lights will be green; when the port is closed they will be flashing red. These lights are to be carried in addition to the ordinary navigation lights, and must be displayed in such a manner as not to be confused with masthead lights. The display of lights at night will be governed by whatever measure of lighting restriction that is in force.

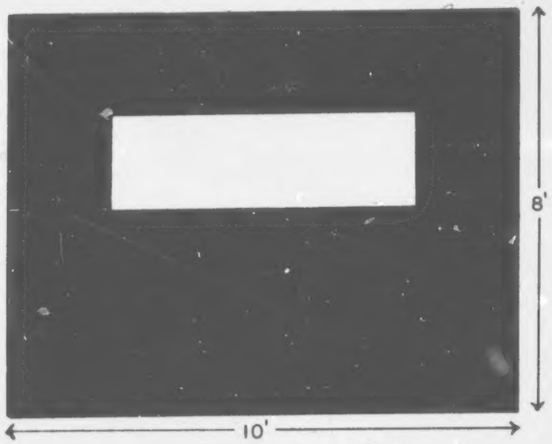


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Figure 4-3.–Examination flag.

SIGNALING INSTRUCTIONS

Voice and visual signaling are to be carried out in accordance with the constructions found in the International Code of Signals (INTERCO) and the additional instructions contained in ACP 148B.

Call Signs

Individual call signs are the same as the ships convoy number as shown in figure 4-4. When transmitted by voice radio this number should be preceded by the word SHIP. Special call signs within a convoy are given below:

Ship or Authority	Transmitted by: Voice Radio/ Flashing Light
Commodore	BULL
Vice Commodore	CALF
Rear Commodore	COLT
Convoy Collective	HERD
This, or. .section	BEEF
OTC	BOSS
Escort ships collective	GANG
Escort ships individual	CHAP*
Rescue ships	CORK*
Guided missile ship	SHOT*
Escorting aircraft	LARK*
Stragglers	LAZY

---

*/followed by 1, 2, etc. as necessary

Flashing Light

Flashing light is a secondary means of communication and its use should be restricted to a minimum. It is normally achieved by using a directional light although a non-directional (all around) light may be used. The procedure is based on that in the INTERCO except for the

	NO. 1 COLUMN	NO. 2 COLUMN	NO. 3 COLUMN	NO. 4 COLUMN	ETC.
CONVOY COLUMNS	01	02	03	04	ETC.
CONVOY CALL SIGNS OF SHIPS	11 12 13 14	21 22 23 24 25	31 32 33 34 35	41 42 43 44	ETC.

105.2

Figure 4-4.—Individual ships are allotted call signs according to their station.

following procedure signs which are used in addition to those given in INTERCO:

PROSIGN	MEANING
FFFF	Used preceding a call to order the called station(s) not to answer this transmission.
$\overline{IX}$	Action on the message or signal which follows is to be carried out upon receipt of prosign $\overline{IX}$ 5 SEC DASH.
$\overline{IX}$ 5 SEC DASH	Carry out the purpose of the message or signal to which this applies.

Executive Method

This method is normally used for transmitting maneuvering signals or other messages which require simultaneous actions.

Example:

The Commodore transmits	Ship No. 15 transmits
15 15	TTTTTTTTTTTTTTT
DE BULL (may be omitted)	T
$\overline{IX}$	T
TANGO	T
ONE	T
FOUR	T
FIVE	T
$\overline{AR}$	R

When ready to execute the commodore transmits:

Commodore	Ship No. 15
15 15	$\overline{TTTTTTTTTT}$
$\overline{IX}$	T
5 SEC DASH	5 SEC DASH
$\overline{AR}$	R

No Response Method

When it is desired to direct ships called not to reply or receipt for a message, the prosign FFFF is to precede the call and the complete transmission will be sent twice. When this method is used, receiving ships are not allowed to use their flashing light to answer the call or receipt for the message.

Flag Signaling

Flag signaling is a secondary means of communication. The procedure is based on what in the INTERCO with the following additional rules:

1. A flag hoist without a call is addressed to the commodore when made by a ship in convoy, or is addressed to the convoy when made by the commodore.
2. The moment of execution for a flag hoist is the moment when the hoist is hauled down.
3. If hoisted by a warship, signals from this publication should be preceded by 4th substitute.
4. All flag signals are to be repeated flag for flag instead of using the answer flag.

MANEUVERING SIGNALS

Alteration of course in succession by wheeling. This is the normal way of altering course when a convoy is steaming in two or more columns. For details as to how to execute the maneuver see ACP 148, paragraph 617.

SIGNAL	HOW MADE	MEANING	EXECUTION	REMARKS
WHISKEY – Superior to three numeral pennants	FLAGS	Wheel to Starboard to course indicated	When flags are hauled down. Commodore and leading ships make one short blast on the whistle.	Commodore will give the signal "STOP ZIGZAGGING AND STEER COURSE_____ prior to this maneuver.
WHISKEY – INFERIOR to three numeral pennants	FLAGS	Wheel to Port to course indicated	When flags are hauled down. Commodore and leading ships give two short blasts on the whistle.	
GN RD GN	COLORED LIGHTS	FIXED – Wheel 20 degrees to Starboard. FLASHING Wheel 5 degrees to Starboard.	When lights are extinguished. Commodore and leading ships make one short blast on the whistle.	ZIG ZAG will be stopped by signal and base course resumed.
RD GN RD	COLORED LIGHTS	FIXED – Wheel 20 degrees to Port. FLASHING – Wheel 5 degrees to Port.	When lights are extinguished. Commodore and leading ships make two short blasts on the whistle.	
GN GN GN	COLORED LIGHTS	FIXED – Resume zig zag FLASHING – Stop zig zag, resume base course	When lights are extinguished. Commodore and lead ships make appropriate whistle signal in accordance with International Rules.	NOTE: ZIG ZAG in progress is cancelled automatically.
FOXTROT – Superior to three numeral pennants	FLAGS	Leading ships turn simultaneously to Starboard to course indicated, remainder following in the wake of their leading ship.	When flags are hauled down. Commodore and leading ships make one short blast on the whistle.	
FOXTROT – Inferior to three numeral pennants	FLAGS	Leading ships turn simultaneously to Port to course indicated, the remainder following in wake of their leading ship.	When the flags are hauled down. Commodore and. leading ships make two short blasts on the whistle.	

Alteration of Course, Column leaders turning simultaneously and the remainder following in succession. This method of altering course is suitable when a convoy is in several columns, and is used instead of a turn when the required alteration of course can be foreseen. For details as to how to execute the maneuver see ACP 148, paragraph 618.

Alteration of Course, All Ships Turning Simultaneously. This method of altering course is used for transferring a Convoy bodily to starboard or port in order to avoid a danger. For details as to how to execute the maneuver see ACP 148, paragraphs 619 and 620.

a. Emergency Turn

SIGNAL	HOW MADE	MEANING	EXECUTION	REMARKS
Flag "E" and 15 Second blast on the whistle repeated by leading ships	FLAGS	Turn simultaneously 45 degrees to Starboard.	When the flag is hauled down and one short blast on the whistle repeated by all ships.	This alteration is reckoned from the course of the convoy at the moment of execution. ZIGZAG in progress is cancelled automatically.
Flag "I" and 15 second blast on the whistle repeated by leading ships	FLAGS	Turn simultaneously 45 degrees to Port.	When the flag is hauled down and two short blasts on the whistle repeated by all ships.	
GN GN RD	COLORED LIGHTS	Turn simultaneously 45 degrees to Starboard.	When lights are extinguished and firing of one green Very light. All ships sound one short blast on the whistle.	
RD RD GN	COLORED LIGHTS	Turn simultaneously 45 degrees to Port.	When lights are extinguished and firing of two red Very lights. All ships sound two short blasts on the whistle.	

b. Turn. All ships turning simultaneously.

SIGNAL	HOW MADE	MEANING	EXECUTION	REMARKS
TANGO – Superior to three numeral pennants	FLAGS	Turn simultaneously to Starboard to course indicated.	When flags are hauled down. All ships make one short blast on the whistle.	NOTE: Zigzag in progress is cancelled automatically.
TANGO – Inferior to three numeral pennants	FLAGS	Turn simultaneously to Port to course indicated.	When flags are hauled down. All ships make two short blasts on the whistle.	

SUPPLEMENTARY SIGNALS

Single Letter Signals

CODE	MEANING
E	Emergency turn 45 degrees to starboard from present course, or if in a turn from the course to which turning. (Stop Zigzagging. Maintain speed)
F (Preceding or following 3 numerals)	Follow leading ships. Leading ships turn simultaneously to course indicated and the remainder follow in succession (Stop Zigzagging. Maintain speed.)
H	Operating helicopters. AT DIP: Am preparing to receive helicopter. CLOSE UP: Am on steady course and speed, ready to receive or be closed by helicopter. HAULED DOWN: Helicopter operations completed.
I	Emergency turn 45 degrees to port from present course, or if a turn from the course to which turning. (Stop Zigzagging. Maintain speed.)
T (Preceding or following 3 numerals)	All ships turn to course indicated. (Stop zigzagging. Maintain speed.)
W (Preceding or following 3 numerals)	Alter course by wheeling as indicated. (Adjust speed as necessary.)
X (Flag)	This ship is the Convoy Commodore.
Y	Heaving line transfer. Flown at yardarm on side where ships will close each other. Meaning: I have mail or other light material for transfer.

	AT DIP	CLOSE UP	HAULING DOWN
By closing ship	Am preparing to make approach	Commencing approach	Line passed
By ship being closed	Am preparing to receive you	Am ready to receive your heaving line. Am on steady course and speed.	Line received.

4th Substitute	Used by a warship to indicate that signal(s) flying are taken from this publication.

Single Pennant Signals

PENNANT	MEANING
0	Open fire
1	Cease fire
2	Nuclear warning. Switch off ventilation system. Do not man guns.

PENNANT	MEANING
3	Sighted mine.
4	Attack warning. Man guns.
5	Sighted submarine, snorkel or periscope.
6	Scatter fanwise and proceed at utmost speed. See Table 501 and ACP 148 paragraph 629 for maneuvering instructions.
7	Sighted torpedo or torpedo track.
8	All clear. (Aircraft in vicinity are friendly.)
9	"Star" and proceed at utmost speed. See Table 501 and ACP 148 paragraph 630 for maneuvering instructions.
Pennants 3, 5, and 7.	Bearings may be added to these signals.

Three Letter Signals

COMMUNICATIONS

CODE	MEANING
XAA	Operate under radio readiness condition ALFA.
XAB	Operate under radio readiness condition BRAVO.
XAC	Operate under radio readiness condition.
XAD	Maintain radio silence.
XAE	Maintain radar silence.
XAF	Use VHF radio only. Maintain MF/HF silence.
	DARKEN SHIP
XBA	Darken ship.
XBB	Show dimmed navigation lights.
XBC	Show shaded stern light.
XBD	Extinguish lights in excess of those ordered.
	FOG
XCA	Veer fog buoy.
	FORMATION
XDA	Form convoy formation (number).
XDB	Form emergency convoy formation (column distance in hundreds of yards) tack (ship distance in hundreds of yards).
XDC	Resume convoy formation.
XDD	Form single line ahead.
XDE	Both wing columns are to form astern of their next inner columns.

GUIDE

CODE	MEANING
XEA	Take guide of the convoy and hoist large merchant ensign at masthead.

GUNNERY

XFA	Guns may be fired for exercise or to unload them.
XFB	Escort ships will carry out exercise firing with guns or AS weapons.

IDENTIFICATION

XGA	Hoist your convoy internal call sign. (When followed by two numeral pennants, this means: Hoist your convoy internal call sign, which is).
XGB	Make your identification signal.
XGC	Show your name boards.

MOVEMENTS

XHA	Disregard my movements.
XHB	Your movements are not understood.
XHC	Follow me over the same track over the ground.
XHD	Act independently.
XHE	Proceed in execution of previous orders.
XHF	Take charge of your section.
XHG	Zig-Zag in accordance with plan ______, TACK (base course) TACK (zero time) (optional). EXECUTION TIME
XHH	Stop Zig-zagging and steer course.

POSITION

XIA	Rendezvous position is (lat), (long), (at time).
XIB	Make rendezvous in position (lat), (long), now or (time).

STATION

XJA	Take up correct station.
XJB	Unable to keep station owing to damage.
XJC	Unable to keep station owing to mechanical defect.
XJD	Take station indicated.

MISCELLANEOUS

XKA	Switch on degaussing.
XKB	EFW is DWD is

COLORED LIGHT SIGNALS

Table of Special Red and Green Colored Light Signals

#	SIGNAL	FIXED OR FLASHING	MEANING
1	GN	Fixed	Wheel 20 degrees to Starboard.
	RD		
	GN	Flashing	Wheel 5 degrees to Starboard.
2	RD	Fixed	Wheel 20 degrees to Port.
	GN		
	RD	Flashing	Wheel 5 degrees to Port.
3	GN	Fixed	Resume Zigzag
	GN		
	GN	Flashing	Stop Zigzag, resume base course.
4	GN	Fixed	Emergency turn 45 degrees to Starboard.
	GN		(See paragraph 203.a.)
	RD		
5	RD	Fixed	Emergency turn 45 degrees to Port.
	RD		(See paragraph 203.a.)
	GN		
6	RD	Fixed	Disregard my movements.
		Flashing	Attack Warning, man guns.
7	RD	Fixed	Cancel all prearranged maneuvers.
	RD		
	RD	Flashing	Cancel maneuver just ordered.
8	GN	Fixed	Decrease speed 2 knots.
	RD		
	RD	Flashing	Decrease speed 1 knot.
9	RD	Fixed	Increase speed 2 knots.
	GN		
	GN	Flashing	Increase speed 1 knot.
10	RD	Fixed	Weigh Anchor.
	GN	Flashing	Anchor immediately.
11	GN	Fixed	Follow me over the same track over the ground.
	GN	Flashing	Resume previous formation, course and speed.
12	GN	Fixed	I am stopping my engines, maneuver to maintain station.
	RD	Flashing	Stop by backing engines, maneuver to maintain station.
13	GN	Fixed	All clear (aircraft in vicinity are friendly).
		Flashing	Leavers to part company now.

General Instructions

This system of communication has been adopted to enable the commodore to communicate at night when voice radio communications are not available. All ships of the convoy will repeat the signal. The time of execution is the time the signal is extinguished. The lights are to be tested daily during daylight hours to ensure that they are operable.

PYROTECHNIC SIGNALS

Table of Pyrotechnic Signals

LINE NO. (For reference only)	SIGNAL	SIGNIFICATION
1	ONE RED Very light	Executive Signal for an emergency turn of 45 degrees TO PORT TOGETHER
2	ONE GREEN Very light	Executive Signal for an emergency turn of 45 degrees TO STARBOARD TOGETHER
3	A SERIES OF RED and GREEN Very lights fired simultaneously	Executive Signal to the ships of a convoy to SCATTER FANWISE AND PROCEED AT UTMOST SPEED
4	A series of RED and WHITE Very lights fire simultaneously	Executive Signal to the ships of a convoy to STAR and proceed at UTMOST SPEED.
5	Not less than two WHITE rockets fired in quick succession	Fired by a ship, when no other sure means of informing friendly ships and forces exist to indicate that she has been damaged by enemy action *OR* to indicate that enemy submarine or surface forces are in her vicinity.
6	One or more White Very lights fired from an aircraft or ship.	DANGER. Merchants ships keep clear.

Use of Pyrotechnics

Pyrotechnics are designed for use at night in case of extreme urgency (i.e., in the event of an enemy attack), threat of enemy attack (when security of position is not of paramount importance), or when thick weather justifies their use of maneuvering.

The use of pyrotechnics for maneuvering in convoy is left entirely to the Commodore's discretion, and, if used, it is for the purpose of emphasizing the urgent nature of the maneuver.

Owing to the possible danger of explosion from fumes, masters of vessels with dangerous cargoes should exercise their discretion in regard to the firing or rockets and pyrotechnics.

Independently routed merchant ship if damaged by enemy action, between dusk and dawn, are to fire two rockets. These should, in good visibility, serve to attract the attention of naval ships, and aircraft, as well as warn other merchant ships in the area. Masters of independently routed ships should turn directly away upon sighting this signal.

A ship in convoy which sights a previously undetected enemy submarine or surface craft, or which is torpedoed, must immediately fire two white rockets in quick succession.

Accidental Firing

A rocket or other pyrotechnic device fired accidentally by a ship in convoy may be visible for as much as 20 miles. This gravely endangers the whole convoy. In the event of a ship firing a rocket or Very's light in error she is immediately to make the coloured light signal meaning "NEGATIVE". In addition the letters NO (-.- - -) may be sounded on the siren. This should prevent the escort from taking the usual countermeasures against enemy attack.

CHAPTER 5

SECURITY

Security of the United States in general, and of naval operations in particular, depends in part upon success attained in safeguarding classified information. Every communicator must be security conscious to the point that he automatically exercises proper discretion in performing his duties and does not think of security of information as something separate and apart from other matters. In this way, security of classified information becomes a natural element of every task and not an additionally imposed burden.

In his daily work routine the Signalman has access to information of vital importance to the military and to the Nation. Some of the vast amount of intelligence carried in messages handled by naval communications passes at some point through the hands of the Signalman–data which, if available to an enemy, would enable him to learn the strength and intent of U.S. forces, and to gather a wealth of technical information relating to procedures and operations of the United States Navy.

Communication personnel use many official documents and publications that relate to such matters as frequencies, call signs, and procedures. Their contents also must be protected, because the more an enemy knows about communications the better are his chances of deriving intelligence from them.

Rules and regulations on the subject of security do not guarantee results, nor do they attempt to meet every conceivable situation. The law of diminishing returns limits control measures that can be employed profitably. In administering security, a balanced and commonsense outlook must be maintained. All concerned must learn to exercise proper discretion in carrying out assigned duties so that observing proper security precautions becomes an automatic and integral part of daily routine.

The Navy is a potential source of valuable information, and unceasing, systematic attempts to exploit that source are to be expected. The methods that may be used are many and varied–planting agents within the naval establishment, photographing or stealing classified documents, tapping telephones and telegraph lines, electronic sensing devices which can be used from a distance, obtaining codes and ciphers, and analyzing naval personnel in their off-duty time. Although information obtained through these means often appears innocuous, it proves to be of real value when subjected to expert, purposeful analysis and combined with other fragments of information from various sources.

As a Signalman you will hear a great deal about the security of classified material, because you will have access to and utilize classified information every day. For this reason, all activities brief newly arrived Signalman in security and require them to sign a statement attesting to the fact that they have received the briefing and understand the contents. Further, as a part of each command's security program, you will be required to read and indicate your understanding of several of the most important national laws and regulations related to security.

Maintaining the security of classified material, however, requires more than a briefing, a regulation, or a law. Security will only be as effective as you make it. There is no one to whom you can transfer your responsibility for protecting this information. Security is a basic part of your assignment just as is operating visual equipment. Security is more than a matter of being careful; it requires both study and practice. Thorough understanding of this chapter will not provide full knowledge of all the finer points concerning security, but it will provide you with a good fundamental background upon which security is built.

PURPOSE OF SECURITY PROGRAM

The security program deals basically with the safeguarding of information that should not be allowed to fall into the hands of foreign governments or foreign nationals because of the danger that such information might be used to the detriment of the United States.

Information may be compromised through careless talk, improper handling of classified material, and in various other ways. Some of the ways in which military personnel may accidentally give away vital information are discussed in *Basic Military Requirements,* NAVPERS 10054.

SECURITY PRINCIPLES

The Department of Defense security formula is based on the premise of circulation control; i.e., the control of dissemination of classified information. According to this policy, knowledge or possession of classified security information is permitted only to persons whose official duties require access in the interest of promoting national security and only if they are determined to be trustworthy.

DEFINITIONS OF SECURITY TERMS

The following definitions are presented to assist you in understanding certain terms used in connection with security.

ACCESS.–The ability and opportunity to obtain knowledge or possession of classified material.

CLASSIFICATION.–The determination that official information requires, in the interest of national security, a specific degree of protection against unauthorized disclosure, coupled with a marking or other identification signifying that such a determination has been made.

CLASSIFIED INFORMATION.–Any matter, document, product, or substance on or in which classified information is recorded or embodied.

CLASSIFIER.–An individual who either: (A) Determines that official information, not known by him to be already classified, currently requires, in the interests of national security, a specific degree of protection against unauthorized disclosure and having the authority to do so, designates that official information as Top Secret, Secret, or Confidential; or (B) Determines that official information is in substance the same as information known by him to be already classified by the Government as Top Secret, Secret or Confidential and designates it accordingly.

CLEARANCE.–An administrative determination by competent authority that an individual is eligible, from a security standpoint, for access to classified information of a specified category.

COMPROMISE.–A loss of security which results from an unauthorized person obtaining knowledge of classified information. The term "unauthorized person" means any person not authorized to have access to classified information.

CUSTODIAN.–An individual who has possession of or is otherwise charged with the responsibility for safeguarding and accounting for classified information.

DECLASSIFICATION.–The determination that classified information no longer requires, in the interest of national security, any degree of protection against unauthorized disclosure, coupled with a removal or cancellation of the classification designation.

DECLASSIFY.–To remove the classification from classified information. Notification to holders of the information is a part of this process.

DERIVATIVE CLASSIFICATION.–The assignment of the proper security classification to information prepared by extracting or copying information from classified material is called derivative classification. The commander or other official whose signature (or other form of approval) is required before a document may be issued, transferred, or referred outside the office of origin is responsible for assigning this classification.

DISCLOSURE.–As it relates to classified information, an officially authorized release or dissemination by competent authority whereby the information is furnished to a specific individual group, or activity.

DOWNGRADE.–To determine that classified information requires, in the interest of national security, a lower degree of protection against unauthorized disclosure than currently provided, coupled with a changing of the classification designation to reflect such lower degree.

LONG TITLE.–A descriptive work or phrase, consisting of a name or of several words, assigned by the preparing agency to identify the subject matter of a document or the type of device.

MARKING.–The physical act of indicating on classified material the assigned classification, changes in classification, the classifier, the declassification date, and any limitations on the use thereof.

NEED TO KNOW.–The term given to the requirement that the dissemination of classified information be limited strictly to those persons whose official military or other governmental duties require knowledge or possession thereof. Responsibility for determining whether a person's duties require that he possess or have access to classified information and whether he is authorized to receive it rests upon each individual who has possession, knowledge, or command control of the information involved and not upon the prospective recipient. This principle is applicable whether the prospective contractor is another Federal agency, or a foreign government. A "need to know" is recognized as established when ALL the following conditions exist: the disclosure is necessary in the interest of national security; there clearly appears from the position, status, duties, and responsibilities of the applicant that he has a legitimate requirement for access to the classified information in order to carry out his assigned duties and responsibilities; there is no other equal or ready source of the same classified information available to him; and the applicant is or can be appropriately cleared for access to the degree of classified information involved and is capable both physically and mentally of providing the degree of protection which that information requires.

OFFICIAL INFORMATION.–Information which is owned by, produced for or by, or is subject to the control of the United States Government.

ORIGINAL CLASSIFICATION AUTHORITY.–Original classification authority is the authority to make original classifications vested specifically and in writing in an official of the Government as the incumbent of an office and in the official specifically and in writing designed to act in the absence of the incumbent.

ORIGINATOR.–The command by whose authority an item of information is created and disseminated.

REGRADE OR RECLASSIFY.–To determine that certain classified information requires, in the interests of national defense, a higher or lower degree of protection against unauthorized disclosure than currently provided, coupled with a changing of the classification designation to reflect such higher or lower degree.

SECURITY.–"Security" is a protected condition of classified information which prevents unauthorized persons from obtaining information of direct or indirect military value. This condition results from the establishment and maintenance of protective measures which ensure a state of inviolability from hostile acts or influences.

SHORT TITLE.–A "short title" is a brief, identifying combination of words, letters, or numbers applied to specific items of classified material.

STOWAGE.–"Stowage" refers to the manner in which classified material is protected by physical or mechanical means.

TRANSMISSION.–"Transmission" (including transit, transmitting, transmittal and other forms of the word) means movement involving the actual transfer of custody and responsibility for a document or other classified material from one command to another command or other authorized addressee.

Each command establishes administrative procedures for recording classified material originated and received, and maintains a receipting system for Secret matter distributed or routed within the command.

Each command also maintains a system that ensures accountability for all Confidential material originated or received.

SECURITY AREAS

Spaces containing classified matter are known as security areas. These security (or sensitive) areas have varying degrees of security interest, depending upon their purpose and the nature of the work and information or materials concerned. Consequently, the restrictions, controls, and protective measures required vary according to the degree of security importance. To meet different levels of security sensitivity, there are three types of security areas; all areas are clearly marked by signs reading "SECURITY AREA–KEEP OUT. AUTHORIZED PERSONNEL ONLY."

EXCLUSIVE AREA

Spaces requiring the strictest control of access are designated EXCLUSION AREAS and are so marked. They contain classified matter of such nature that, for all practical purposes, admittance to the area permits access to the material.

An exclusion area is fully enclosed by a perimeter barrier of solid construction. Exits and entrances are guarded, or secured and alarm protected, and only those persons whose duties require access and who possess appropriate security clearances are authorized to enter.

LIMITED AREA

A limited area is one in which the uncontrolled movement of personnel permits access to the classified information therein. Within the area, access may be prevented by escort and other internal controls.

The area is enclosed by a clearly defined perimeter barrier. Entrances and exits are either guarded, controlled by attendants to check personal identification, or under alarm protection.

Operating and maintenance personnel who require freedom of movement within a limited area must have a proper security clearance. The commanding officer may, however, authorize entrance of persons who do not have clearances. In such instances, escorts or attendants and other security precautions must be used to prevent access to classified information located within the area.

CONTROLLED AREA

A controlled area does not contain classified information. It serves as a buffer zone to provide greater administrative control and protection for the limited or exclusion areas. Thus, passageways or spaces surrounding or adjacent to limited or exclusion areas may be designated and marked controlled areas.

Controlled areas require personnel identification and control systems adequate to limit admittance to those having bona fide need for access to the area.

CATEGORIES OF CLASSIFIED INFORMATION

TOP SECRET

The Top Secret classification is limited national security information or material requiring the highest degree of protection. It is applied only to information or material the defense aspect of which is paramount, and the unauthorized disclosure of which could result in EXCEPTIONALLY GRAVE DAMAGE to the Nation, such as–

1. A war, an armed attack against the United States or her allies, or disruption of foreign relations vitally affecting the national security of the United States.
2. The unauthorized disclosure of military or defense plans, intelligence operations, or scientific or technological developments vital to the national security.

SECRET

The Secret classification is limited to national security information or material which requires a substantial degree of protection, the unauthorized disclosure of which could result in SERIOUS DAMAGE to the Nation, such as–

1. Jeopardizing the international relations of the United States.
2. Endangering the effectiveness of a program or policy of vital importance to the national security.
3. Compromising important military or defense plans, or scientific developments important to national security.
4. Revealing important intelligence operations.

CONFIDENTIAL

The use of the Confidential classification is limited to national security information or material which requires protection, the unauthorized disclosure of which could reasonably be expected to cause damage to the national security, such as:

1. Operational and battle reports that contain information of value to the enemy.
2. Intelligence reports.
3. Military radio frequency and call sign allocations that are especially important, or are changed frequently for security reasons.
4. Devices and material relating to communication security.
5. Information that reveals strength of our land, air, or naval forces in the United States and overseas areas, identity or composition of units, or detailed information relating to their equipment.
6. Documents and manuals containing technical information used for training, maintenance, and inspection of classified munitions of war.
7. Operational and tactical doctrine.
8. Research, development, production, and procurement of munitions of war.
9. Mobilization plans.
10. Personnel security investigations and other investigations, such as courts of inquiry, which require protection against unauthorized disclosure.
11. Matters and documents of a personal or disciplinary nature, which, if disclosed, could be prejudicial to the discipline and morale of the armed forces.
12. Documents used in connection with procurement, selection, or promotion of military personnel, the disclosure of which could violate the integrity of the competitive system.

NOTE: Official information of the type described in paragraphs 10, 11, and 12 is classified Confidential only if its unauthorized disclosure could reasonably be expected to cause damage to the security interests of the Nation. If such information does not relate strictly to defense, it must be safeguarded by means other than the Confidential classification as indicated in following text.

SPECIAL MARKINGS

In addition to the security labels mentioned already, other markings also appear on classified material. Among these markings are such designations as "Restricted Data," and "For Official Use Only."

Restricted Data

All data concerned with (1) design, manufacture, or utilization of atomic weapons, (2) production of special nuclear material, or (3) use of special nuclear material in production of energy bear conspicuous "Restricted Data" markings. Restricted data, when declassified under the Atomic Energy Act of 1954, must be marked "Formerly Restricted Data, Handle as Restricted Data in Foreign Dissemination, Section 144b, Atomic Energy Act, 1054."

For Official Use Only

The term "For Official Use Only" (FOUO) is assigned to official information that requires some protection for the good of the public interest but is not safeguarded by classifications used in the interest of national defense.

PREPARATION AND MARKING

Each document or material is classified according to the importance of the information it contains or reveals. It is important to identify individually items of information which require protection and then to consider whether compromise of the document or material as a whole would create a greater degree of damage than compromise of the items individually. The classification of the document or material must be the classification that provides protection for the highest classified item of information or for the document or material as a whole, whichever is higher.

The purpose of markings required for classified material serves to record the proper classification, to inform recipients of the assigned classification, to indicate the level of protection required, to indicate the information that must be withheld from unauthorized persons, to provide a basis for derivative classification, and to facilitate downgrading and declassification actions.

Upon assignment of a classification category to information, it is immediately marked clearly and conspicuously on all documents.

On documents the classification marking of TOP SECRET, SECRET, or CONFIDENTIAL is stamped, printed, or written in capital letters that are larger than those in the text or the document. The marking is mandatory in addition to the typed or printed designation required by the *Correspondence Manual.* When practicable, the markings are red in color. On other types of material, the classification marking is stamped, printed, written, painted, or affixed by means of a tag, sticker, decal, or similar device in a conspicuous manner. If marking is not physically possible on the material, written notice of the assigned classification is provided to recipients of the material.

TITLES AND SUBJECTS

Regardless of the overall classification of a classified document (except certain high-level security documents), the originator will attempt to assign an unclassified title or subject to the material when consistent with security and clarity. In all cases, however, the initial or initials of the classification assigned to the document will be indicated in parentheses immediately following the item, using one of the following notations: (U), (FOUO), (C), (S), and (TS). When appropriate, the symbol (RD) or (FRD) may be added to Restricted Data or Formerly Restricted Data. It is not necessary to assign one of these notations to the subject of a letter, endorsement, or memorandum of transmittal, if a statement is included indicating that they are unclassified upon removal of enclosures or basic material.

REFERENCED MATERIAL

Except as precluded by requirements of communications security, documents which refer to classified information need not bear the security markings of the referenced material if reference is made only by means such as file number, dates, date-time group, other identifying symbols, or subjects (provided the subject, standing alone, is not classified).

PARAGRAPHS

All classified documents, including correspondence and electrically transmitted messages, must be paragraph marked. When classifying paragraphs, the appropriate classification marking is placed in parentheses to the left of the paragraph immediately following the numerical designation or preceding the first word if the paragraph is unnumbered. If desired, the symbols (TS), (S), and (C) may be used. In the case of unclassified information the symbols (U) or (FOUO), as appropriate, may be used. When restricted data or formerly restricted data is involved, the symbols (RD) or (FRD) may be added to the appropriate classification symbol.

When different items of information in one paragraph require different classification, but segregation into subparagraphs or separate paragraphs would destroy continuity or context, the highest classification required must be applied to that paragraph.

Whenever paragraph markings are impracticable, a statement must be included on the document or in its text identifying the parts of the document that are classified and their assigned classification, or an appropriate classification guide, must be attached as part of the document. When it is known that the prospective recipients of a document are in possession of an appropriate classification guide, reference to the guide in the body of the document may be made in lieu of attaching the guide.

CHANGE IN CLASSIFICATION

When classified information is determined to require a different level of protection than that presently assigned, or no longer requires protection, it is regraded or declassified.

A mandatory continuing program based on a time schedule has been established for automatically downgrading and declassifying documents originated within the Department of Defense.

The automatic downgrading and declassification system was instituted to ensure that all classified matter is available to the general public when secrecy is no longer necessary and to relieve the originator of future concern for the classified aspects of documents or material they have produced.

Depending on the contents of the material, classified information is placed into one of four groups. The assigned grouping indicates whether the material may be declassified automatically in the future and if so, when.

On March 8, 1972, the President signed Executive Order 11652. The intent of the executive order was that less official information would be classified, more declassified, and that which is classified would be better protected.

DOWNGRADING AND DECLASSIFICATION MARKINGS

At the time of origination, each classified document or other material created after 1 June 1972 shall, in addition to the required classification marking of TOP SECRET, SECRET, or CONFIDENTIAL, be marked for downgrading and declassification conspicuously on the front cover or first page, with an appropriate declassification notice.

When generating *new documents after 1 June 1972* whose classification is based on documents with the old Group 1, 2, or 3 markings, the following markings will be used (TOP SECRET authority is not required for exemption):

Classified by (circle if known the original classification authority, classification guide, or other classification source document. If not feasible because of multiplicity of sources, leave blank)

Exempt from GDS of E.O. 11652

Exempt category (insert as appropriate one of the four new categories)

Declassify on "31 December" (insert whenever possible, year that is more than 10 years but less than 30 years from original classification date. If a 10 to 30 year date cannot be determined, use 30 year date.)

When generating messages after 1 June 1972 whose classification is based on documents with old group 1, 2, or 3 markings, the following marking will be used (TOP SECRET authority is not required for exemption):

XGDS (insert as appropriate one of the four new categories)

All Group 4 material will be subject to the General Declassification Schedule (GDS) but declassification actions will start on 1 January 1973. Individual items of this body of material which would normally be declassified under the GDS could be exempted from the GDS if exempted by an individual with TOP SECRET classification authority prior to 1 January 1973.

When generating new documents after 1 June 1972 whose classification is based on documents with old Group 4 markings, the following markings will be used:

Classified by (cite if known the original classification authority, classification guide, or other classification source document. If not feasible because of multiplicity of source leave blank)

Subject to GDS, automatically downgraded at two year intervals and declassified on (insert as appropriate, date, 6, 8, or 10 years after classification source date)

When generating electrically transmitted messages after 1 June 1972 whose classification is based on documents with old Group 4 markings, the following markings will be used:

GDS (insert last two figures of appropriate year which is 10, 8, or 6 years from date of earliest classification source date)

When classifying material after 1 June 1972 which is not based on material classified under the old system, the following procedures apply:

DATE

or

EVENT

Classified by (must have appropriate original classification authority or cite authorized classification guide)

Downgrade to:

SECRET on (date must be prior to that called for under the GDS)
CONFIDENTIAL on (date must be prior to that called for under the GDS)

Declassify on (date must be prior to that called for under the GDS)

or

GDS

Classified by (must have appropriate original classification authority or cite authorized classification guide)

Subject to GDS E.O. 11652, automatically downgraded at two year intervals

Declassify on 31 December (insert year 6, 8, or 10 years hence as appropriate)

or

EXEMPT

Classified by (must have original TOP SECRET classification authority or cite authorized classification guide)

Exempt from GDS of E.O. 11652

Exempt category (insert one or more of four exemption categories)

Declassify on "31 December" (insert whenever possible year that is more than 10 years but less than 30 years from original classification date. If a 10 to 30 year date cannot be determined, use 30 year date.)

or

DATE or EVENT MSG

Declassify (insert date (day, month, year) or event)

(NOTE: Record copy only should indicate classifier)

GDS MSG

GDS (insert declassification year: e.g. 78)

(NOTE: Record copy only should show all information required)

or

EXEMPT MSG

XGDS (insert number of exempt category and last two digits of year in which declassified.)

(NOTE: Record copy only should show all the information required)

These procedures apply to electrically transmitted messages as well as to other forms of recorded information. The old group markings: GP 1, 2, 3, and 4 will no longer be used.

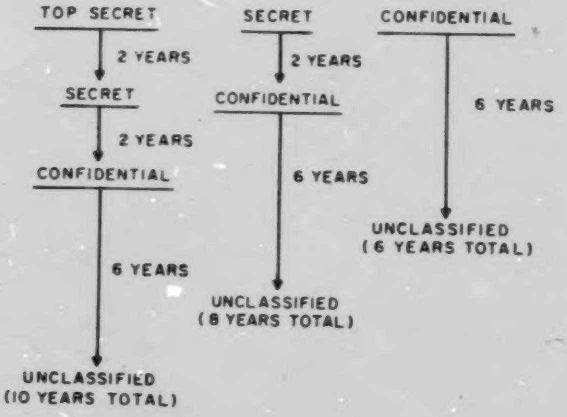
GENERAL DECLASSIFICATION SCHEDULE

1. TOP SECRET: Information and material shall be downgraded to SECRET two calendar years after origination, downgraded to CONFIDENTIAL four years after origination, declassified ten years after origination.

2. SECRET: Information and material shall be downgraded to CONFIDENTIAL two calendar years after origination, declassified eight years after origination.

3. CONFIDENTIAL: Information and material shall be declassified six calendar years after origination.

In each case, downgrading or declassifying occurs at the end of the appropriate full calendar year following the year in which the information or material was originated (or in other words, on 31 December of the appropriate year). (See fig. 5-1.)



46.69(37C)

Figure 5-1.—Downgrading and Declassification (General Schedule).

EXEMPTIONS FROM THE GENERAL DECLASSIFICATION SCHEDULE

The exempted information or material whether Top Secret, Secret, or Confidential must fall in one or more categories.

1. Furnished by foreign governments or international organizations and held by the United States on the understanding that it be kept in confidence.
2. Specifically covered by statute (e.g., restricted data and formerly restricted data) or pertaining to cryptography, or disclosing intelligence sources or methods.
3. Disclosing a system, plan, installation, project, or specific foreign relations matter the continuing protection of which is essential to the national security.
4. Disclosure would place a person in immediate jeopardy.

In each case, the top secret authority shall specify by number the exemption category being claimed. The classification authority shall specify a date or event for the automatic declassification of the information or material involved, no less than 10 years and not more than 30 years from year originated.

If it becomes necessary to classify the information or material by broad category, such as nuclear propulsion data, the classification authority must obtain CNO approval.

Whenever possible the original classifying authority will be shown including, if applicable, the identification of the controlling classification guide. If this is not shown, the person who signs or finally approves the document or directive will be deemed the classifier and he must maintain records which show the sources or reasons for his classifications.

TRANSMISSION

Transmission is movement involving the actual transfer of custody and responsibility for a document or other classified material from one command to another command or other authorized addressee.

Although transmission may be accomplished by messenger, mail, wire circuits, secure radio, or other means, the purpose in every case is to keep the information out of the hands of those not authorized to have it.

The most appropriate means of transmission should be selected within the requirements of precedence and security.

MESSENGER

Classified matter is transmitted by messenger when security–not speed–is the paramount objective. The principal messenger agency for the Department of Defense is the Armed Forces Courier Service (ARFCOS). This agency is responsible for the safe transmittal of highly classified matter to military addressees and certain civilian agencies throughout the world. The ARFCOS courier transfer stations are located in designated areas. Every item of classified material sent via ARFCOS is in the physical custody and control of a military courier from the time of entry into the system until the addressee or his authorized representative receipts for it. Classified material that may go by registered United States mail is not transmitted by ARFCOS.

MAIL

In addition to transmitting unclassified material, the United States postal system is used to transmit classified material except Top Secret matter and cryptographic aids and devices. Secret matter must be sent by registered mail instead of by ordinary mail, and must not enter a foreign postal system. Confidential material can be mailed through the United States Postal Service certified or first class mail within United States boundaries. United States Postal Service registered mail shall be used for (1) Confidential material of NATO, SEATO and CENTO; (2) APO or FPO addressees, and (3) other addressees when the originator is uncertain that their location is within the United States boundaries. The single exception to this is that material addressed to Canadian Government activities is permitted to pass through the Canadian postal service. The great bulk of the Navy's administrative traffic is sent by mail, thus reserving radio circuits for operational traffic insofar as possible.

Mailable Secret and Confidential material is double wrapped–the classified material being sealed inside an opaque container which is then sealed within a second opaque container. The inner container shows the address of the receiving activity, the classification of the enclosed material (including special markings), and any applicable special instructions. It is carefully sealed to minimize the possibility of access without leaving evidence of tampering. The outer container shows the address of the receiving activity and the correct return address of the sender. The outer container DOES NOT bear a classification marking. Top Secret mail is prepared for transmission in a similar manner, but is NOT transmitted by mail, since it must be transmitted under a continuous chain of receipts.

TRANSMISSION SECURITY

Transmission security is that component of communication security resulting from all measures designed to protect transmission from interception, traffic analysis, and imitative deception. Every means of transmission is subject to interception. In radio transmission, it must be assumed that all transmissions are intercepted.

Within requirements of precedence and security, the most appropriate means of transmission should be selected. Following are the usually available means of transmission, in order of security: (1) messenger, (2) registered mail, (3) approved wire circuit, (4) ordinary mail, (5) nonapproved wire circuit, (6) visual, (7) sound systems, and (8) radio.

SPEED VERSUS SECURITY

Three fundamental requirements of a military communication system are reliability, security, and speed. Reliability is always paramount. Security and speed are next in importance and, depending on the stage of an operation, are interchangeable. During the planning phase, for instance, security is obviously more important than speed; during the execution phase, speed may possibly surpass security in importance.

This statement is not meant to imply that either requirement can ever be ignored completely. Modern high-grade cryptosystems permit security with speed. In tactical operations, however, when speed is so important that time cannot be spared for encryption, and transmitted information cannot be acted upon by an enemy in time to influence current operations, messages of any classification except Top Secret may be transmitted in the clear over any wire or radio circuit. Each message must be approved and released separately. Any linkage to previously encrypted messages should be avoided. Such transmissions include the word CLEAR at the beginning of the text to indicate the message contains classified material. Upon receipt, the message is marked "Received in the clear" and is handled as Confidential. If information must be further transmitted, an entirely new message is drafted.

WIRE SYSTEMS

Two categories of wire systems are utilized in transmitting classified information. They are approved and nonapproved. These systems include telephone, telegraph, teletypewriter, and facsimile facilities. Many requirements that must be met before designating that a wire circuit is approved are not taken up in this text.

Any approved circuit may be designated as such only by a service Chief of Staff, Chief of Naval Operations, supreme commander of a theater of operations, or such officers as they may specify. The number of approved circuits is kept to a minimum consistent with operational requirements. Each approved circuit is rated according to the highest classification of information authorized to be transmitted over it in the clear. Under no circumstances, however, is information classified higher than Secret so transmitted.

Except in those situations discussed previously, where speed is more important than security, no classified information may be transmitted in the clear over nonapproved circuits.

VISUAL TRANSMISSION SECURITY

The various means of visual transmission, in order of security, are these day and night groups:

Day: (1) hand flags, (2) directional flashing light, (3) panels, (4) flaghoists, (5) pyrotechnics, and (6) nondirectional flashing light.

Night: (1) infrared communication systems, (2) directional flashing light, (3) pyrotechnics, and (4) nondirectional flashing light.

Transmission of a classified message in plain language by visual means is authorized only after careful consideration is given to the possibility of interception by unauthorized persons. The aperture of directional flashing light equipment is kept as narrow as possible, and filters are used at night to reduce detectable range. Under no circumstances are translations of encrypted messages transmitted by visual means. This method subjects the entire cryptosystem to possible compromise.

RADIO TRANSMISSION SECURITY

When a message is transmitted by radio, it sometimes is possible to know a few receivers, but all of them never become known. It must be assumed that an enemy receives every transmission. Properly prepared messages using modern cryptosystems may prevent an enemy from understanding a message, but he still can learn a lot. As time for a planned operation approaches, for instance, the number of messages transmitted increases so markedly that, although an enemy may be unsure of its exact nature, he knows that something will occur soon and he can alert his forces accordingly. Strict radio silence is the main defense against radio intelligence.

The amount of radio traffic is not the only indicator used by an enemy. He can be expected to run statistical studies of message headings, receipts, acknowledgments, relays, routing instructions, and services. From such studies communication experts can learn much about an opponents operations, past and future. By means of direction finders they determine where messages originate, which is a valuable aid in their studies.

Although traffic analysis by the enemy cannot be prevented, it can be made more difficult and less reliable. Such measures as the following can be taken:

1. Make maximum use of communication means other than radio.
2. Maintain strict circuit discipline.
3. Use broadcast method where possible.
4. Rotate call signs and address groups.
5. Reduce use of service messages.
6. Use codress messages.
7. Encrypt all classified messages.
8. Reduce test transmissions to minimum.
9. Avoid external routing instructions.

RADIOTELEPHONE SECURITY

Radiotelephone nets are operated so frequently that many operators tend to be careless. There are too many instances of interception of VHF/UHF transmissions at distances of many thousands of miles for this condition to continue.

Certain rules apply, and all persons having occasion to use a radiotelephone should be thoroughly familiar with them.

1. Use each circuit for its intended purpose only. Keep number of transmissions to a minimum.
2. Think out contents and wording before starting transmission in order to reveal no information of military value, even by implication.
3. Write message before transmission, if practicable.
4. Keep all transmissions brief, concise, and clear.
5. Transmit no classified information in plain language, including plain language references to classified titles, units, places, chart references, or persons that may reveal the nature of the headquarters, task force, or other units concerned.
6. Avoid linkage between radiotelephone call signs and any other call signs.
7. Follow prescribed radiotelephone procedure at all times.

DESTRUCTION OF CLASSIFIED DOCUMENTS

When it becomes necessary to destroy classified documents, the recommended methods are by burning, shredding, pulping, or pulverizing. Destruction is accomplished in the presence of two witnesses. A witnessing official may be a commissioned officer, warrant officer, enlisted person E-7 or above. If none of these are available, a mature or reliable enlisted petty officer E-5 or E-6, or U.S. civilian employee in grade GS-5 or GS-6 may be designated as a witnessing official. All persons witnessing the destruction of classified material must have a security clearance at least as high as the category of material being destroyed, and they will be thoroughly familiar with the regulations and procedures for safeguarding classified information.

When appropriate, certificates of destruction are prepared and signed by witnessing officials. These officials will observe complete destruction of the classified documents and the residue of such documents will be checked to determine if destruction was complete and that reconstruction is impossible. When burning classified material, efforts must be made to ensure that portions of burning material are not carried away by winds or drafts.

A Certificate of Destruction (OPNAV Form 5511-12, Rev. ( )) must be prepared for nonregistered Top Secret and Secret documents. These certificates are retained for a period of two years by the command destroying the material and will include a complete identification of the material destroyed and the date of destruction. It also includes the signature of the officer authorizing the destruction and the witnessing officials.

In the case of Secret documents only, use of routing sheets, mail logs, and other similar administrative records is authorized in lieu of a Certificate of Destruction, provided all necessary information (identification of material, date of destruction, signature of officer authorizing destruction and witnessing officials) is included thereon. Confidential or lower classified documents do not require a Certificate of Destruction.

ROUTINE DESTRUCTION

Destruction of superseded and obsolete classified materials that have served their purpose is termed routine destruction.

Destruction may be accomplished by burning, pulping, pulverizing, or shredding. Burning is the method used most commonly aboard ship.

It is most likely that an SM 3&2 will be called upon to assist in burning classified material. Every member of the burn detail should know exactly what is to be burned and should doublecheck each item before it is burned. Routine destruction of classified messages and trash generally is handled on a daily basis owing to the rapid accumulation of these materials and the limited space available for storage. To facilitate the complete destruction of classified material, individual pages should be placed loosely into a burn bag prior to burning. For example, bound documents should be torn apart, pages crumpled, and fed to the fire a few pages at a time. All materials must be watched until it is completely consumed. The ashes must be broken up and sifted through to ensure complete destruction. Following complete destruction of the classified matter, the Burn Log entry is made and the officer present is required to inspect the ashes and sign as a witness to the destruction. Upon his approval, the ashes are disposed of in accordance with command policy.

EMERGENCY DESTRUCTION

Emergency destruction of classified material is authorized any time it is necessary to prevent its capture by an enemy.

Destruction plans call for the highest degree of individual initiative in preparing for and in actually commencing the required destruction. It is extremely important for all Signalmen to understand that in emergencies, subjecting classified material to compromise through capture, they must start necessary destruction under the plan without waiting for specific orders.

The order in which classified material is to be destroyed under emergency conditions should be determined in advance and the material so marked and stored. The effective edition of the OPNAV Instruction 5510.1 offers directions about the priority of destruction.

Cryptographic material has the highest priority for emergency destruction. Insofar as humanly possible, it must not be permitted to fall into enemy hands. Other classified matter is destroyed in the order of classification—highest classification first.

Destruction by fire is the preferred method for all combustible materials. Oil or chemicals may be used to facilitate burning. Classified equipment must be smashed beyond recognition and unclassified equipment should also be demolished beyond repair.

A sufficient number of destruction tools—including sledge hammers, screwdrivers, axes, and wire cutters—are always kept in CIC and equipment spaces for use in emergency destruction.

SECURITY VIOLATIONS AND COMPROMISES

When classified information has been lost, compromised, or subjected to compromise, action is initiated to regain custody of the information and afford it proper protection.

INVESTIGATIVE ACTIONS REQUIRED

Any individual discovering a loss, compromise, or subjection to compromise of classified information reports the facts immediately to the most readily available command.

The command which receives the individual's report takes immediate action to gain custody of the information concerned and affords it adequate protection. An initial inquiry is conducted to identify accurately the information concerned; to determine the circumstances involved in the discovery of the loss, compromise, or subjection to compromise; and tentatively to establish whether the possibility of compromise is remote or substantial. For U.S. Navy and Marine Corps originated classified information, a report of the results of the initial inquiry is sent by rapid means to the command having custodial responsibility for the information concerned. (When the command making the initial inquiry is also the command having custodial responsibility, this report is made to the originator.) Information copies are forwarded to the originator and the Chief of Naval Operations (ACNO (Intelligence)). If the loss or possible compromise is of pages or parts of a classified document (with the exception of registered cryptographic publications), and if the command determines upon initial inquiry that compromise could not have resulted or that possibility of compromise is remote, an information copy of the report need not be furnished to the Chief of Naval Operations.

Upon receipt of the initial inquiry, if further action is required, the command having custodial responsibility makes or arranges for, a thorough inquiry into the matter. When circumstances indicate, the investigative services of the nearest Naval Investigative Service Officer should be requested.

After reviewing the record of investigation, the command having custodial responsibility institutes procedures to prevent a recurrence of loss or compromise and takes or recommends disciplinary action, as appropriate, in the case of personnel found responsible.

Upon receipt of the report of initial inquiry advising of the loss, compromise, or subjection to compromise, which may or may not require further action, the originator of the classified information reevaluates all programs, plans, and operations which could in any way be affected by the loss, compromise, or subjection to compromise, in order to determine and implement necessary modifications in such programs, plans, and operations. The originator promptly notifies all holders of copies of the material, as well as those activities whose programs, plans, or operations could in any way be affected by the loss, compromise, or subjection to compromise, in order that they may undertake reevaluation of the programs, plans, and operations, and implement necessary modifications thereto.

CARE DURING WORKING HOURS

Each person in the naval establishment must take every precaution to prevent deliberate or casual access to classified information by unauthorized personnel. Among the precautions to be followed are:

- When classified documents are removed from stowage for working purposes they are to be kept under constant surveillance or face down or covered when not in use.
- Visitors not authorized access to the classified information within a working space are received or interviewed in a specially arranged reception room or area.
- Drafts, carbon sheets, carbon paper, typewriter ribbons (one time), plates, stencils, stenographic notes, worksheets, and similar items containing classified information are either destroyed by the person responsible for their preparation after they have served their purposes, or are given the same classification and safeguarded in the same manner as the classified material produced from them.
- New typewriter ribbons used in the preparation of classified material are either typed on until illegible, or given the same classification and safeguarded in the same manner as classified material prepared from them.
- Classified material, upon receipt, is opened by the addressee or by persons specifically authorized by him in writing to open material of the grade involved.
- If for any reason, a room must be vacated during working hours, any classified material therein must be stowed in accordance with stowage instructions for the classification involved.

CARE AFTER WORKING HOURS

A system of security checks at the close of each working day must be instituted to ensure that classified material held by a command is properly protected. Custodians of classified material are required to make an inspection which ensures as a minimum that:

- All classified material is stowed in the prescribed manner.
- All classified material which is passed from watch to watch is properly accounted for.
- Burn bags are properly stowed or destroyed.
- The contents of wastebaskets which contain classified material are properly stowed or destroyed.
- Classified shorthand notes, carbon paper, typewriter ribbons, rough drafts, and similar papers are properly stowed or destroyed. As a matter of routine during the day, such items are to be placed in burn bags immediately after they have served their purpose.

Identification of the individual responsible for the contents of each container of classified material must be readily available. The individual so identified is contacted in the event a container of classified material is found open upon inspection.

CONTROL OF DISSEMINATION

Persons in a command status are responsible for controlling the dissemination of classified information emanating from or distributed within their commands. They are also responsible for promulgation of directives, as necessary, to prevent unauthorized dissemination of information under their control. The existence, nature, content, or whereabouts of classified information is not divulged needlessly.

Dissemination of classified information is limited to those persons whose official military or other Government duties require access in the interests of promoting national defense, and who have been properly cleared for access thereto.

Responsibility for determining whether a person's official military or other governmental duties require that he possess or have access to classified information and whether he is authorized to receive it rests upon each individual who has possession, knowledge, or command control of the information involved, and NOT upon the prospective recipient. In the case of a foreign government there is an additional requirement for written authorization from CNO.

ACCOUNTABILITY

Control and accountability of classified documents are necessary to prevent excessive production or reproduction, to limit dissemination, to make all recipients known, and to allow for control of all information. These requirements can be fulfilled by effective supervision, conscientious and informed execution of personal responsibilities, and efficient management.

The accounting system for an activity should provide readily available information on: (1) what classified material has been received, (2) what classified material has been produced, (3) who has custody of a particular document, and (4) what disposition has been made of Top Secret and Secret material. There are two methods of accounting for classified material–the classified material control record and the logbook method.

Classified Material Control Record

The classified material control record is used for control of incoming and internally routed classified matter. This record serves as a continuous receipt system required for all Top Secret material. It is a multiple-carbon form which requires little time for preparation. The form is supplied in three colors: green, Confidential; yellow, Secret; and pink, Top Secret. Part 4 of the control record is a 3 x 5 card called the Classified Material Inventory-Locator Record which is filed indefinitely. Final disposition of material is indicated on the reverse side of this card.

Classified Material Log

Activities that handle small quantities of classified material (20 items or less a day) will find the logbook system to be the most practical method for accounting for data. In this system, the log is divided into two sections–incoming and outgoing. Each piece of material sent or received is then recorded in the appropriate section.

DISCLOSURE RECORD

All persons having knowledge of DOD information classified Top Secret must be identifiable at all times. Each office originating or receiving Top Secret information maintains a list of all persons within such organization or office having access thereto. This identification is accomplished by attaching a Disclosure Form to the material and any individual gaining knowledge of it affixes his name, the name of the activity, and the date of access thereto. If a person's signature is used and it is not clearly legible, the name is also printed. The disclosure record form is not detached from the material to which it is attached unless it is transmitted to another activity for retention. When the disclosure form is detached, it is retained locally for a minimum period of 1 year.

The disclosure record form is used in addition to the continuous receipt system (classified material control record) which is required for Top Secret material.

There are two exceptions to the requirement for attaching the disclosure record form: (1) mail rooms, file rooms, communication and message centers, and printing and reproduction activities engaged in processing large volumes of Top Secret material may not require assigned personnel to sign individually the disclosure record form if access to the area is limited to permanently assigned personnel and if these individuals are identifiable by roster as having access on any given date, and (2) oral discussions within committees or conferences involving the disclosure of Top Secret information are also subject to accounting requirements. The requirement is considered satisfied if the minutes of the conference or meeting shows a summary of the information discussed or furnished and a complete listing of all persons present.

ACCOUNTING FOR CLASSIFIED INFORMATION

Accounting for Top Secret

Except for publications containing a distribution list by copy number, all copies of each Top Secret document and each item of Top Secret equipment is serially numbered at time of origination; e.g., Copy No_____ of_____ copies. Each page of a Top Secret document not containing a list of effective pages is numbered "Page_____ of_____ pages."

Top Secret documents are not reproduced without permission of the issuing officer or higher authority.

When Top Secret documents are reproduced with permission of the issuing officer or higher authority, all reproduced copies are serially numbered and recorded with the Top Secret control officer in order to maintain complete accountability. An acceptable method of identifying the new copies is to label them "Copy number 12/1 of_______ copies," "Copy 12/2 of_____ copies," etc. The first number (12) is the copy number of the original series from which reproduction is made.

The control of Top Secret material is maintained by the Top Secret control officer, if one is designated, or the classified material control officer.

Accounting for Secret

As a minimum requirement, commands must establish administrative procedures for recording all Secret material originated and received, and distributed or routed to components of, or activities within, the command. The disclosure record form is a valuable aid in maintaining security of Secret material.

Accounting for Confidential

All Confidential material that is received or produced by a command must be recorded.

Serial Numbers

The *Correspondence Manual* prescribes that classified correspondence shall be serially numbered by the originator for each calendar year. A serial number is one of a consecutive group of Arabic numerals assigned to a specific piece of correspondence for identification purposes. A separate series of numbers is used for each specific category of classified information. Serial numbers for Confidential letters are preceded by the letter "C"; those for Secret, by "S"; and for Top Secret, by "T".

STOWAGE OF CLASSIFIED DOCUMENTS

The Chief of Naval Operations has developed physical security standards and requirements which serve as a uniform guide for determining the kind and degree of physical protection required for classified matter. These standards and requirements designed to provide flexibility as well as adequacy in the physical security program for the protection of this type of materials, are intended to serve the following purposes:

1. Provide a more definite basis for planning and implementation of the physical security program.

2. Achieve greater uniformity in the protective measures provided for facilities having like security interests.

3. Achieve greater consistency by narrowing the limits of individual interpretation.

4. Provide a more definite basis for keying security measures to the security interest involved.

A system of numerical evaluation provides a uniform guide for establishing security protection for stowed material which is commensurate with the security interest of such material. It provides not only a means of determining the relationship between the security interest and the level of protection, but also sets forth values for various elements of the security which may be combined and integrated to produce an acceptable security system. The system of numerical evaluation does not guarantee protection, nor does it attempt to meet every conceivable situation; however, with a commonsense implementation of the system it is possible to obtain a satisfactory degree of security with a minimum of sacrifice in operational efficiency.

The elements of the numerical evaluation system are: (1) a table of equivalents (fig. 5-2), which assign a numerical value for various types of stowage areas, containers, guarding, and alarm systems, etc.; and (2) an evaluation graph (fig. 5-3) which establishes, in the form of numerical values, minimum levels of relative security required for the protection of classified material.

The following is an example of the implementation of the numerical evaluation system.

GIVEN: One metal file cabinet with a built-in combination lock, civilian watchman in the general area, no protective alarm system, and control of personnel access. By referring to the table of equivalence (fig. 5-2), you can obtain the number of points allotted for each of the given safeguards.

Metal file cabinet with built-in combination lock	15
Civilian watchman in general area	10
No protective alarm system	0
TOTAL POINTS	25

Take 25 and go to the evaluation graph (fig. 5-3). By finding 25 and going down the graph, you will see that this particular group of safeguards is capable of holding moderate quantities of Confidential material or one Secret document.

KEYS AND COMBINATIONS

Keys for padlocks used to protect classified material are given the same degree of protection that is required for the material they protect. It is essential that combinations be known, or keys accessible to, only those persons whose duties require access to the containers involved.

The combination of a security container is changed—

1. when the container is received;
2. when any person having a knowledge of it leaves the organization;
3. at any time there is reason to believe the combination has been compromised; and
4. at 12-month intervals.

Combination locks left in an unlocked condition and not under continuous surveillance must be changed before they are used again. Any paper showing the combination to a lock is given the same classification as the material within the container.

Records of combinations are sealed in an envelope and kept on file by the classified material control officer, duty officer, or any other person designated by the commanding officer. In selecting combination numbers, multiples of 5, simple ascending or descending arithmetical series, and personal data, such as birth dates and serial numbers are to be avoided. The same combination is not used for more than one container in any one area.

Make sure that all personnel concerned are indoctrinated in the requirement for rotating the dial of combination locks at least three complete turns in the same direction when securing safes, files, or vaults. In most locks, if the dials are given only a quick twist, it is generally possible to open the lock by merely turning the dial back in the opposite direction. Additionally, responsible personnel are required to ensure that all drawers of safes and file cabinets are held firmly

Element of Security	Value
1. Stowage Areas:	
a. Security Fences:	
(1) Classified area surrounded by a security fence with all gates secured or controlled	5
b. Protective Lighting:	
(1) Security areas lighted by protective lighting	5
c. Building or Ship:*	
(1) Conventional frame or good quality temporary structure	5
(a) Controlled areas within	15
(b) Limited areas within	25
(c) Exclusion areas within	35
(2) Masonry or steel structure with substantial partitions, floors and ceilings (including magazines)	10
(a) Controlled areas within	20
(b) Limited areas within	30
(c) Exclusion areas within	40
(3) Aboard a Commissioned Ship	25
(a) Controlled area	35
(b) Limited area	40
(c) Exclusion area	50
(4) "In Service" or MSC chartered vessel	10
(a) Controlled areas within	20
(b) Limited areas within	30
(c) Exclusion areas within	40
2. Stowage Containers:**	
a. Metal, keylock (built-in)	0
b. Metal, key padlock (attached)	0
c. Metal, high security key padlock (attached)	5
d. Metal, combination padlock (attached)	5
e. Metal, high security combination padlock (attached)	10
f. Metal, combination lock (built-in)	15
g. Strongroom or weapons magazine	15
h. Class C Vault	50
i. Class B Vault	60
j. Class A Vault	70
k. Class 2, approved GSA security container	60
l. Class 3, approved GSA security container	50
m. Class 4, approved GSA security container	60
n. Class 5, approved GSA security container	70
o. Class 6, approved GSA security container	55
p. Class 5 map and plan, approved GSA security container	70

Element of Security	Value
2. Stowage Containers—Continued	
q. Class 6 map and plan, approved GSA security container	55
3. Guarding:	
a. Supporting Guard Force:	
(1) Civilian Supporting Guard Force	10
(2) Military Supporting Guard Force	15
b. Guards:	
(1) Civilian Guards:	
(a) Civilian guard in general area	10
(b) Civilian guard check of container each hour	15
(c) Civilian guard check of container each ½ hour	20
(d) Civilian guard in attendance at container	30
(2) Military Guards:	
(a) Military guard in general area	15
(b) Military guard check of container each hour	20
(c) Military guard check of container each ½ hour	25
(d) Military guard in attendance at container	60
c. Sentry dog accompanying military or civilian guard	10
4. Protective Alarm Systems:	
a. Area Alarm System:	
(1) Make or break (electro-mechanical) alarm to detect entry into immediate area	5
(2) Other alarm system to detect entry into immediate area	10
(3) Alarm system to detect entry or attempted entry into immediate area	15
(4) Alarm system to detect entry or attempted entry and approach to immediate area	25
b. Container Alarm Systems:	
(1) Make or break (electro-mechanical) alarm to detect opening of container	10
(2) Other alarm system to detect opening of container	15
(3) Alarm system to detect opening or tampering with container	20
(4) Alarm system to detect opening or tampering with and approach to container	25

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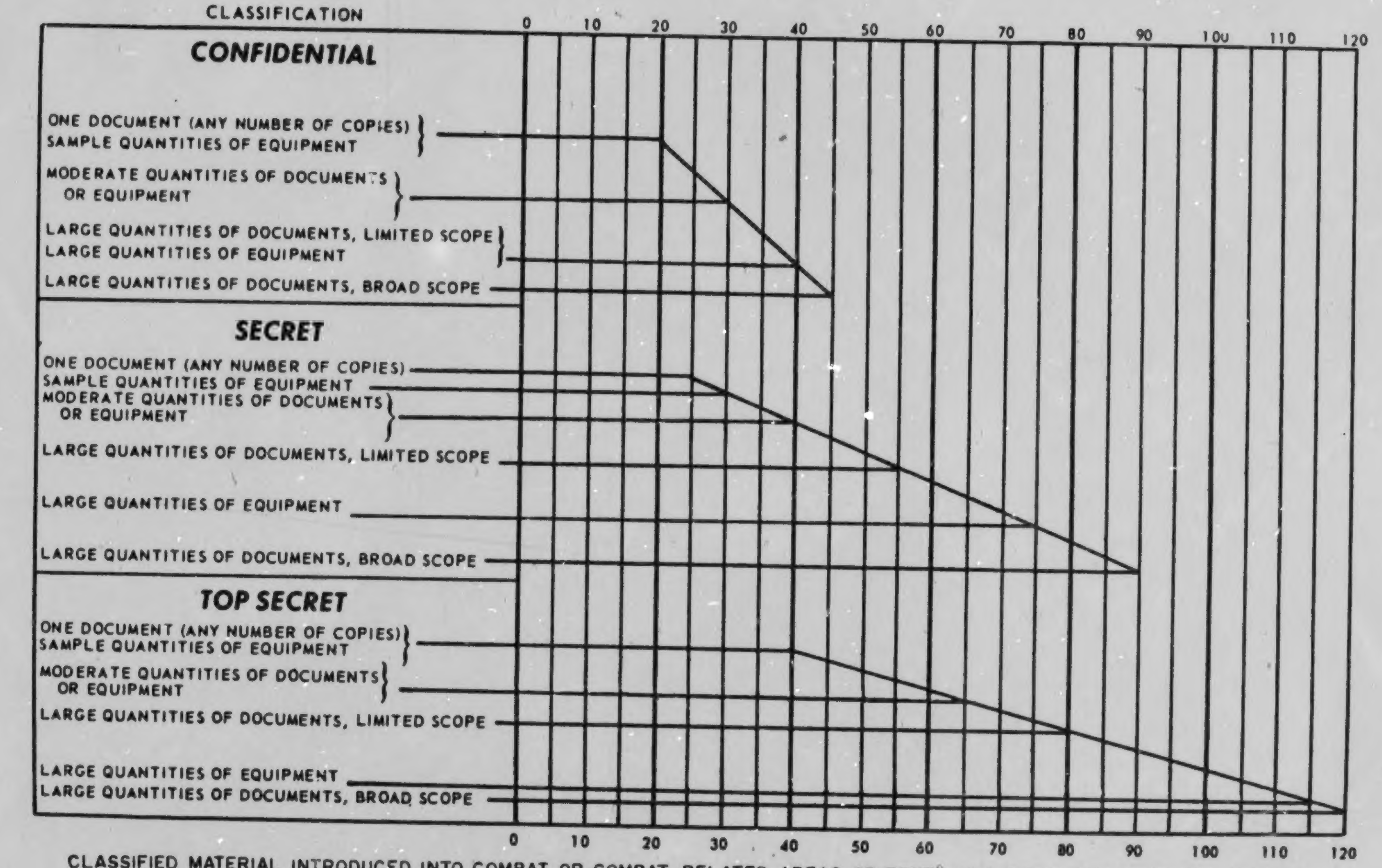
* Buildings must be under U.S. Government control or if not under U.S. Government control the space occupied within the building must be at least a controlled area.

** Evaluate as indicated provided other elements in the security program are available to minimize the possibility of unauthorized access to the container.

31.3

Figure 5-2.—Table of numerical equivalents.



SECURITY OF MATERIAL IN STORAGE

CLASSIFIED MATERIAL INTRODUCED INTO COMBAT OR COMBAT-RELATED AREAS OR ZONES WILL BE SAFEGUARDED TO AFFORD PROTECTION AS NEARLY TO THE DEGREE PRESCRIBED FOR THE CLASSIFICATION OF THE MATERIAL AS THE CIRCUMSTANCES PERMIT.

31.2

Figure 5-3.—Evaluation graph.

in the locked position when they are closed. All built-in combination locks must be equipped with a plastic dust cover.

CONTAINERS FOUND OPEN

Whenever a container in which classified material is stowed is found unlocked, in the absence of assigned personnel, the incident is reported immediately to the senior duty officer present. The container must be guarded until the duty officer arrives and upon his arrival, he will inspect the classified material, lock the container, and make a security violation report to the commanding officer. If the duty officer feels that the classified information may have been compromised, he will order the responsible person to return to the ship or station and make a definite inspection report. Further appropriate action will be taken by the commanding officer or higher authority.

SUBVERSION OF MILITARY PERSONNEL

There are a number of ways in which agents of foreign governments may attempt to subvert military personnel in order to gain access to security information. If you understand some of the methods used by foreign agents, you can be on the alert for actions that might get you involved with subversive parties.

To begin with, it should be remembered that cost, time, and effort are no obstacles to a foreign government that is really out to get vital information. Trained agents may be sent to areas near military installations, where they may spend weeks, months, or even years establishing themselves and becoming friendly with military personnel.

One of the commonest methods of subversion involves getting a hold on a person who might be in a position to obtain classified information. The hold can be almost anything–excessive drinking, illicit personal relationships, the use of drugs, or excessive monetary indebtedness, to name but a few of the habits or actions that have gotten people into trouble. A person with a problem of this sort is fair game for foreign agents, since he can be blackmailed into doing things that are in violation of security regulations.

Trained foreign agents know how to exploit weaknesses wherever they find them. For example, consider a petty officer who has gotten deeply in debt through gambling or just poor budgeting. The agent may skillfully get the man even deeper in debt, then lend him money to help him get out of trouble. Eventually the petty officer will find himself in a position where he feels that he cannot refuse to give the agent small and relatively unimportant pieces of information. The information requested is usually minor, at first; but the demands increase as time goes on, and the petty officer may finally become so involved and so trapped that he ends up giving vital information to a foreign agent.

A person who is married and has family obligations is a prime target for another approach. He may be taken to parties or other social gatherings and introduced to women who, unknown to him, are actually foreign agents or in the pay of foreign agents. If the military man becomes sufficiently involved with one of these women, all meetings and actions are recorded and photographed without the victim's knowledge. When sufficient evidence has accumulated, the victim is blackmailed into turning over information. Small bits of relatively unimportant information may be requested at first; but it will not be long before more vital information is demanded.

As may be seen from these examples, a person who has been selected to be a source of information to a foreign agent is in a very difficult position. His weak points are emphasized and played upon until he feels completely trapped. In desperation, he feels that he has no course of action except to cooperate and furnish information to the foreign agent.

However, this is not true. There is always one honorable way to get out of this kind of difficulty. If you should ever find yourself entangled in such a situation, DO NOT ALLOW YOURSELF TO BE BLACKMAILED. Tell the whole story to your division officer, legal officer, or security officer. Don't try to handle the situation by yourself; your chances of being able to outwit a highly trained foreign agent are just about zero. So tell your story fully and completely, including any wrong actions of your own, and accept the consequences. Remember that whatever wrong actions you may have committed up to this point are nothing compared to the act of actually cooperating with a foreign agent.

SECURITY CLEARANCES

A security clearance is a formal declaration that an individual is eligible to have access to certain classified information. This action is normally taken by the commanding officer and is made a matter of record in each instance by the issuance of a Certificate of Clearance (OPNAV Form 5521-429), a signed copy of which is placed in the person's service record. The highest level of classified matter to be handled is named, such as Top Secret or Secret. A Certificate of Clearance need not be executed for military personnel authorized to handle Confidential information unless the basis for authorization is a Background Investigation or a National Agency Check.

Eligibility for clearance is established by an investigation of the person's background, including his actions, his family, and his associates, for a number of years (in some cases for his entire life).

Because an investigation may take some time, commanding officers may grant an "Interim-Clearance," pending receipt of the investigation report. An interim clearance is an administrative determination for temporary access to classified material. An interim clearance is given when the person is needed at once for work with classified matter and when it appears likely that the results of the investigation will be favorable.

TYPES OF INVESTIGATIONS

Investigations are carried out in order to effect a final security clearance. Whenever it is established that an individual will need access to classified matter, investigations will be requested. An investigation must be initiated at the time any interim clearance is issued.

A final clearance is executed upon satisfactory completion of the investigation, unless the requirement for clearance no longer exists.

Personnel security investigations are of two types:

1. National Agency Check
2. Background Investigation

Detailed instructions for requesting personnel security investigations are set forth in OPNAVINST 5510.1D and DOD Directives 5210.8 (REF (H)) and 5220.6 REF (T) as appropriate.

GUIDE TO PERSONAL CONDUCT

Your personal conduct can result in the denial or revocation of your security clearance, and/or punishment under the UCMJ or civilian law. You must always be security conscious even after separation from the Naval Service. You have a personal responsibility for maintaining the security of any classified matter of which you have knowledge—past or present. The unauthorized disclosure of classified information will not be tolerated.

During your security briefing you read certain Criminal Statutes of the United States Code relating to defense information. To assist you in remembering them, the following is a list of acts which, committed advertently or inadvertently, are punishable by law.

- Communicating or giving to unauthorized persons any information relating to the national defense.
- Permitting such information in your custody to be stolen or destroyed through your own gross negligence.
- Failing to report to your superior the known loss or destruction of such information.
- Hiding or shielding any person whom you believe or suspect has taken, communicated to unauthorized persons, or lost such information; or who has permitted any such information to be stolen or destroyed.
- Making defective in any manner an article or material which is to be used or is in any way connected with the national defense.
- Damaging or destroying any building, property, or equipment used in connection with the national defense.
- Taking, stealing, or damaging any property which is being made for or which belongs to the government.
- Photographing or making any map or sketch of anything relating to or being

manufactured for the national defense, except when authorized or in the performance of your regular duties.

- Disobeying any order or regulation published by the Secretary of Defense, or his designated representative, which relates to the security or protection of any national defense plant.
- Reproducing, publishing, selling or giving away photographs, sketches, pictures, drawings, maps, or graphical representation of any military installation or equipment.
- Possession of classified material or material which would be detrimental to the United States except in the proper work area. This includes the taking of classified material to an individual's home without proper authorization.
- Knowingly and willfully falsifying or concealing of material fact.
- Making false, fictitious or fraudulent statements or representations.

On Duty Responsibility

While on duty you, as a military member of the Naval Establishment, are responsible for such security responsibilities in your office or space as may be assigned by your supervisor. You may not delegate this responsibility.

It is your responsibility to safeguard classified information from unauthorized disclosure. This may be accomplished by constant reference to the clearance status and "Need to Know" requirement on the part of those persons being given access to classified information under your control. Every member of the Naval Establishment verified as being cleared may disclose classified information to other individuals in the course of official activities only.

After they have determined the clearance status of the other party, they must then determine that the person to be given access to the classified information concerned has the official "Need to Know" which necessitates such access. This procedure is not necessary for those personnel whose clearance status is known to you and involved in day-to-day working relationship. Once again, it is emphasized that the basic responsibility for safeguarding the security of classified information rests with each individual having knowledge and use of such information.

Off-Duty Responsibility

Discussion of classified aspects of your work should not be carried on at military or civilian social gatherings, even though all personnel present are cleared. Furthermore, classified material shall not be removed from the confines of your ship, station or activity except on approved official business. Extreme care should be exercised with members of your family or your friends. They are not cleared. They have no "Need to Know" and they have not been indoctrinated in the necessary safeguards required for the security of classified information.

A General Guide

It is not possible to provide each individual with a complete list of "do's and don'ts" as far as security is concerned. There are, however, two "rules of thumb" which will usually help in answering the questions, "Should I do this?" or "Should I say this?"

Rule 1. Could spies or traitors possibly learn anything from this?
Rule 2. Could this possibly help spies or traitors verify something that they already have ideas about or have guessed?

If there is the slightest possibility that the answer to either of these two questions might be "Yes," "Probably," or even "Possibly," the action should not be taken or the statement should not be made. One of the personal restrictions that working with classified material requires of an individual is that conduct and speech must always be guarded. The goal of the Security Program is to train military and civilian personnel to the point that whenever and however a topic comes which has even the most remote bearing on classified information, the employees will automatically become alert, watchful and on their guard against security slips.

The following list may be used as a general guide to answering the many questions that may be asked concerning security information

1. You may disclose the command you work for by simply stating that you work for the Department of the Navy, at the address to which you are assigned. Using utmost discretion, you may give the official address of your command, your general job title, your grade and salary, and length of service, if required. If any further information is desired by persons or firms with whom you may be dealing, instruct them to request such information by letter addressed to your commanding officer.

2. When replying to questions by anyone, including your immediate family, concerning the nature of your assignment, you should state that your work is classified and that the law prevents you from revealing the type of work in which you are engaged.

3. Caution your family not to discuss your assignment with others. They should simply state that they do not know what your duties are. Remember, the less your family knows about your job, the less likely they are to unwittingly reveal information of value to foreign intelligence.

4. If a complete stranger is overly persistent in questioning you about your job, simply inform him that you do not care to discuss the subject farther. Quiz him as to his name, address, and purpose of his inquiry. He will probably drop the subject. You may leave his presence, if circumstances permit, or change the subject. In all cases, report the facts and circumstances to your commanding officer.

5. Classified matters may only be discussed outside your assigned ship or station in other secure government spaces, and then only if it is necessary in order to effect official business. First determine the clearance status of the other party and his "Need to Know" in conjunction with that business. The information will be limited to that which is necessary to carry on official business.

6. You may associate with non-citizens on a close social basis. However, any contact other than official with personnel from communist-controlled countries should be reported to your commanding officer immediately. Meetings with other foreign nationals need not be reported.

7. There may be restrictions on going overseas after leaving your present assignment, either for a new assignment or privately. The specific restrictions are dependent upon the type of classified information to which you may have had access and the area of the world to which you wish to go. The length of time the restriction is imposed depends upon the assignment that you held. Certain other restrictions are imposed on private overseas travel by the State Department. When leaving your present assignment you will be informed as to what restrictions apply, if any.

8. There are also security requirements concerning vacation or business travel abroad. Your commanding officer will assure that you are given a defensive security briefing to alert you to be on guard against exploitation by others whose interests may be inimical to those of the United States, prior to travel under the following conditions:

- Travel to or through communist-controlled countries for any purpose.
- Attendance at international, scientific, technical, engineering, or other professional meetings, in any country outside the United States where it can be anticipated that communist-controlled representatives will participate or be in attendance.

9. Generally speaking, nothing may be written or said for public consumption about the status, mission, composition, organization, or function of the command that you are presently assigned to or the results that it obtains. Of course, certain information may be printed for public consumption, but only the commanding officer or his designated representative may release such information.

10. Upon learning of what appears to be a security violation by the press, radio, television, or by any other means normally available to the public, bring it to the attention of your security officer or commanding officer. State the facts: What, when, where, how, and by whom. If it is printed material, submit a copy or an actual clipping of the material. Include the identification of the periodical, and the author and/or photographer.

11. From time to time you may wonder why you are required to be so security conscious when the news media seems to be telling everything. This is understandable. However, always remember that just because certain items appear in periodicals, newspapers, or on the air,

it does not necessarily mean that their publication was authorized nor does it mean that the information is factual. Frequently, such releases are the educated guesses of the author.

Do not deny, affirm, or comment on such material; it will only aid in establishing as fact that which, before, was only suspected.

12. When separated from the Naval Service you must continue to be security conscious, especially when applying for a job. During your job interview, you may state that you were attached to a particular command, along with your general job title. Under no circumstances may you include Department of Defense classified information. It is recommended that prior to your separation you write a complete job description of your duties and responsibilities. Take your resume to your division officer for his advice, assistance, and clearance.

As a Signalman you will have access to large amounts of classified material, which sometimes makes life aboard ship very tedious. The majority of your shipmates do not have a security clearance, let alone a "Need to Know." They will be very inquisitive particularly about the ship's schedule and operations. You can not, of course, give them any classified information. Be ever-mindful of where you are, even when you are talking to other Signalmen. Security information can only be discussed in secure spaces aboard ship. Discussion of security information is forbidden in any of the other spaces aboard ship, such as the messhall of your berthing compartment.

The above list does not cover every circumstance which may arise. Should a situation arise which is not covered in this chapter, no statement should be made. Report the situation to your superior and an appropriate answer will be given for future guidance.

You alone are responsible for any violation of security that you may deliberately or unintentionally commit. You are urged to become fully acquainted with the contents of the Department of the Navy Security Manual for Classified Information as soon as possible. Moreover, you must always vigilantly guard against violating the trust which has been placed upon you. To relax security, even for a moment, may invite disaster.

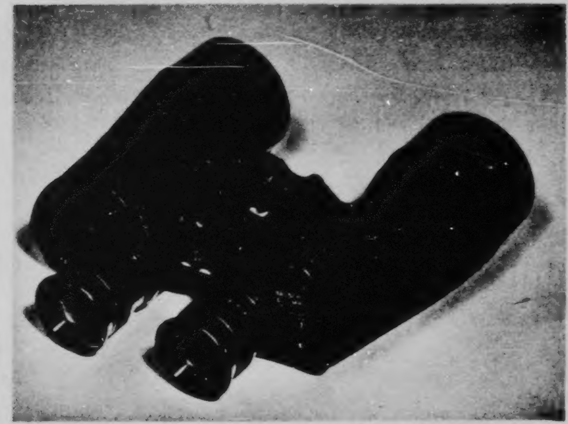
CHAPTER 6

EQUIPAGE AND MATERIAL MANAGEMENT

OPTICAL EQUIPMENT

Unless Signalmen have seen the "insides" of binoculars and telescopes, they usually tend to handle these delicate instruments carelessly. Figures 6-1 through 6-3 show how sturdy these glasses look on the outside. Figures 6-4 and 6-5 show the delicate prism and lens assembly inside the glasses. These glasses are one of the most important pieces of signal bridge equipment—without them a Signalman is literally lost. Careless handling of glasses during an extended cruise (away from repair facilities) can put the signal bridge out of commission in a hurry. Discussed first are some sensible precautions in handling glasses. Later in this chapter are examined other items where supervision of material and equipment has an important bearing on the performance of the signal gang.

Optical instruments are expensive because their manufacture requires skill and precision. They are precision instruments, consequently they are difficult to repair. Most of their parts are costly and hard to replace. A person who drives a car knows a little extra care will save him money. This theory is also true of optical instruments. Any damage that Signalmen prevent will make their job easier.



37.1

Figure 6-1.—7x50 binoculars, Mk 13.

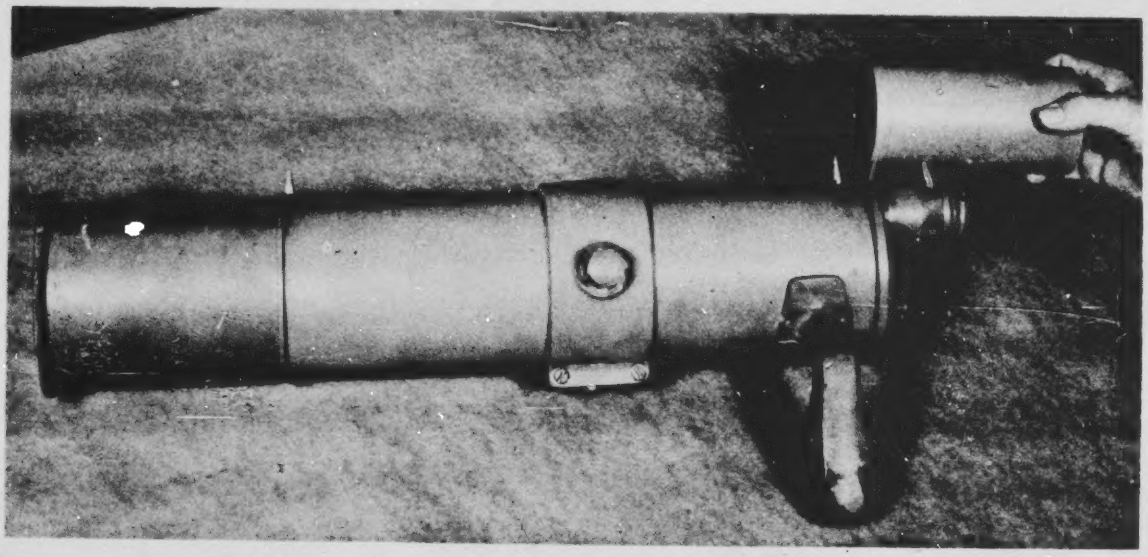
A successful Signalman makes a habit of handling equipment and material cautiously. Optical equipment is one of the Signalman's most valuable aids. Proper care of this equipment is an all-hands responsibility. By constant, conscientious supervision, see to it that petty officers in each section safeguard the equipment.

HANDLING AND STOWAGE

Optical instruments must be stowed carefully in cases or boxes. Containers are designed to protect instruments from the effects of vibration and shock. See to it that an instrument is kept in its case at all times unless there is a good reason for taking it out. When instruments are moved from one place to another, have them moved in their cases. When men are using binoculars, make sure the strap is kept around the neck.

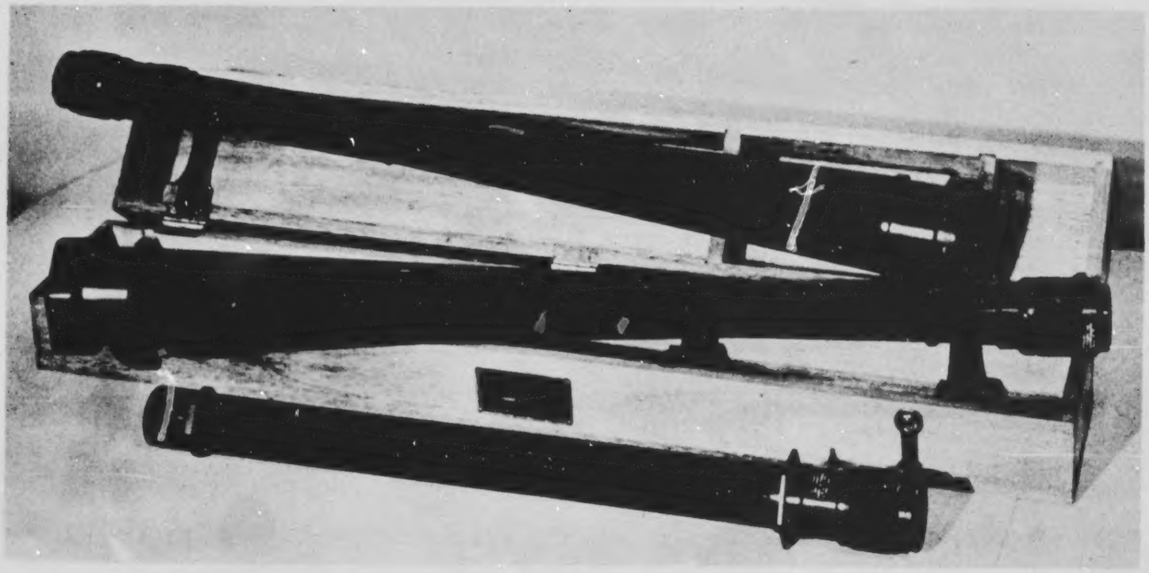
A severe shock (such as failing to the deck during heavy seas or during gunfire) may cause breakage, either of lenses and prisms or mechanical parts. Prisms and reticles usually have adjustable mounds, and even a small shock may cause misalignment. Then, opticalmen at a tender or yard shop must unseal the instrument, disassemble it, restore the adjustment and check it, and reseal. It's a lot easier to educate the men in safeguarding the instruments from shock and vibration than to go through the expensive and time-consuming repair procedure.

Shock and vibration aren't the only enemies of precision optical instruments. Dust, heat, light, and moisture are almost as bad. What are the best possible conditions for an optical



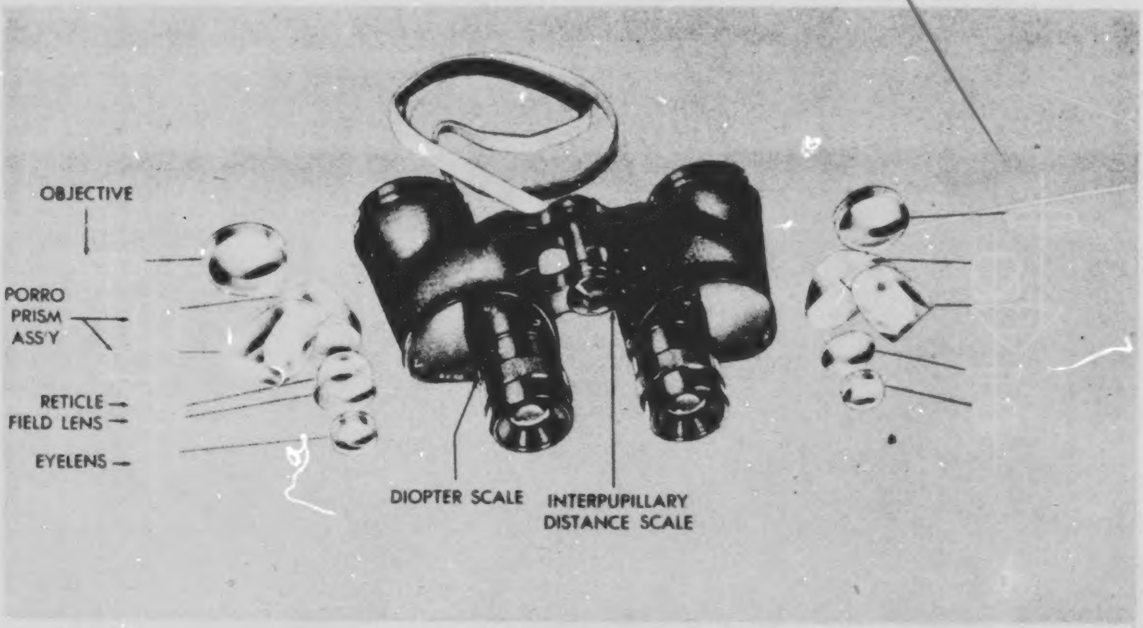
37.2(37A)

Figure 6-2.–Ship's telescope.



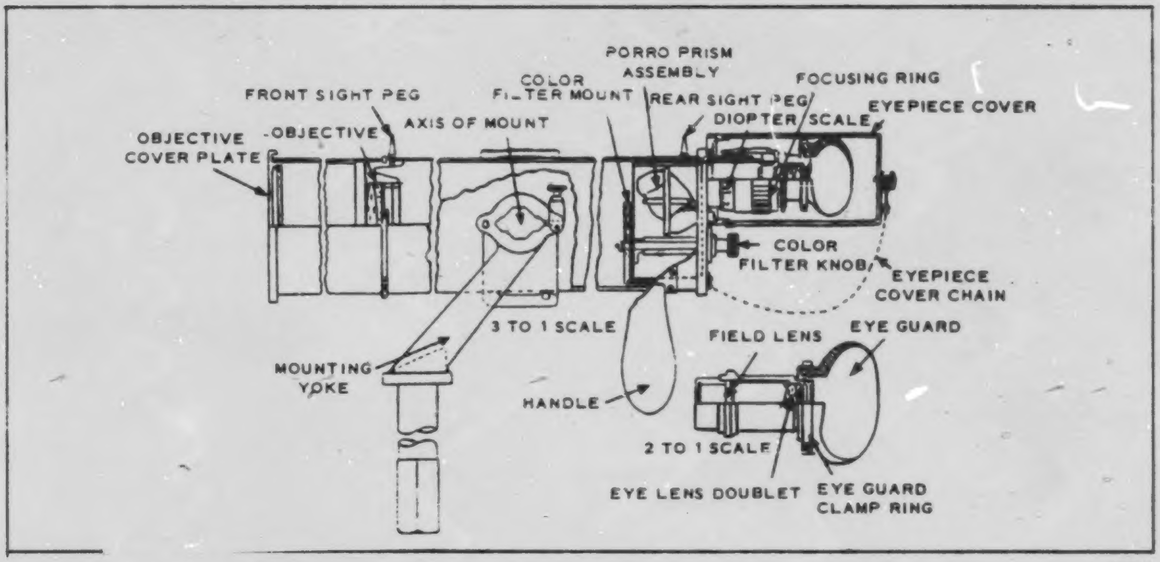
37.2

Figure 6-3.–OOD's long glass and QM's spyglass.



37.4

Figure 6-4.—Binoculars—prism and lens assembly.



37.5

Figure 6-5.—Schematic diagram of ship's telescope, Mk 1.

instrument? It should be carefully wrapped to protect it from dust. It should be stored in a completely dry place, in the dark, and at a constant temperature somewhere between 60° and 70°F. All of these conditions are almost impossible to meet at all times, but come as close to them as possible.

A large part of the dust that settles (especially indoors) is lint from clothing, bedding, and furniture. Dust in shipyards and such places contains mineral particles that are harder than glass or steel. Removing dust from an optical surface can be a problem. Trying to wipe it off grinds the particles into the glass and leaves a trail of scratches. When grit and mineral dust settles on bearing surfaces and mechanical parts it causes serious wear. For this reason, protect all instruments from dust. Keep them in their cases. If they have lens caps, leave the caps in place except when instruments are actually in use.

An instrument that is damp from spray needs prompt attention. Wipe the optical surfaces gently with lens paper and dry the housing with a clean cloth. If the air is humid, keep all bearing surfaces protected by a thin film of vaseline. Keep all other unpainted metal surfaces covered with a thin film of oil. Keep oil and grease off the optical surfaces and away from points where they might be carried to optical surfaces.

When moisture reacts with acid fumes and dust, it causes rapid weathering of optical glass. Salt water or water and acid fumes cause serious corrosion of unprotected metal parts. Bacteria often settle on glass surfaces, and in the presence of moisture they may form a dull gray film on the glass. Moisture encourages the growth of stains on lens surfaces.

Perspiration from a person's fingers contains small amounts of salt, uric acid, and acetic acid. All three can cause films and chemical deterioration of optical glass. Don't let sweaty fingers touch optical surfaces or the cleaning materials used on them.

Dry heat doesn't harm glass or metal unless the temperature is very high, but is harmful to cemented lenses and filters. Excessive heat softens the cement and may cause the elements to separate. Over a period of time, heat dries the cement and makes it brittle. When brittle, even slight shock or vibration may crack it or separate the elements.

It's a good idea to protect cemented elements from direct sunlight. Strong sunlight not only hardens cement but also discolors it. If an instrument has a lens hood or sunshade, keep it in place when the instrument is exposed to the sun.

Inspection

Regular and frequent inspections of optical instruments on board will save a lot of work by finding little troubles before they turn into big ones. After each inspection submit rough work requests to the division officer covering any discrepancies noted. If the required work is beyond ship's force capability, it will be taken care of during upkeep or overhaul.

In checking the condition of optical equipment, remember examine the housing, mount, and bearing surfaces. First, look for dents, cracks, or breaks. Small dents may not be serious (unless they're on a bearing surface), but cracks or breaks need immediate attention. Any crack in housing or any loose or broken seal soon causes moisture to condense inside the instrument. The pressure of the atmosphere changes slightly from day to day, and these changes make the instrument "breathe" in warm, moist air in the daytime. At night, when the air cools, moisture condenses inside the instrument. The next day the instrument goes through another "breathing" cycle and condenses more moisture. When a film of moisture covers one or more of the optical surfaces, the instrument is temporarily useless.

Check on mechanical condition: Examine all mechanical adjusting screws and check all knob and gear mechanisms for slack or excessive tightness. If the instrument moves on bearings, test them for looseness or binding. If the instrument has filters operated by input shafts, check them by turning the shafts. All these mechanisms must move freely, but there must be no slack or lost motion. Moving parts should be tight enough to stay where they are put.

Check on optical system: Examine the optical surfaces–as many as can be seen from the outside–for cleanliness. First check the end windows and the outside surfaces of both ends. Look for dust, dirt, moisture, and grease. Examine the inner refracting surfaces by looking through the ends as one would through window glass. It may help if a lower power magnifying glass is used. As the glass is moved closer to the instrument, one surface after another comes into focus.

Look through the instrument and focus it on a distant object. If the image is hazy or cloudy there's probably a film of moisture on one or more of the optical surfaces. If dust is seen in sharp focus, superimposed on the image, the reticle is dirty.

Examine the optics for any evidence of scratches, chips, and cracks. If there's a mirror or prism in the instrument, look for peeling or darkening silver. Check the ocular and objective ends for faulty cement. The cement should be transparent and completely colorless. Look for signs of darkening, yellowing, and cracking. Look for clouded or opaque areas. (They may be rounded splotches, or threadlike, or network-like.) If cemented elements are beginning to separate, bubbles will be seen in the cement. They may be rounded and near the center, or they may be long and finger-shaped, projecting inward from the edge of the lens.

Now check the instrument for parallax. Focus on a distant target, then move one eye from side to side. The crosslines of the reticle should stay at one spot on the target. If they should appear to move back and forth over the target as the eye moves, parallax is present.

Cleaning

To clean the outside surface of an optical instrument, wipe it with a soft, clean cloth. Don't use this cloth for any other purpose. Above all, don't use it on optical surfaces; it can easily pick up enough grit and abrasive particles to scratch them.

If a few particles of dust are found on the objective, leave them there—they won't hurt anything. They'll prevent light from passing through the area they cover, but they'll have no effect on the image. A film of dust or dirt on a lens surface is serious, however.

Don't clean a lens when it doesn't really need it. Repeatedly cleaning a lens—no matter how skillfully—eventually damages the glass. Keep lens paper clean. Never leave it exposed where dust can fall on it.

PYROTECHNICS

The weapons (or deck) department is responsible for loading, stowage, promulgation of safety precautions, and unloading all ammunition and explosives, including pyrotechnics. As a general rule, large quantities of pyrotechnics are stowed in signal spaces and are used mostly by Signalmen. The leading Signalman, then, has a definite responsibility to his men to ensure that they know and understand the operating principles and safety precautions in connection with pyrotechnics. Keep the following points in mind, and make certain that all of the men understand them too.

1. Some pyrotechnics ignite spontaneously in water. For this reason, they must be stowed in areas specially protected from moisture. A sprinkler system is no help if they ignite.
2. Some pyrotechnics produce poisonous fumes when wet—another reason why they must have dry, specially protected stowage, and why it is dangerous to fight fires with water if pyrotechnics are present.
3. Some pyrotechnics explode with great violence and produce intense heat when ignited.
4. The primer (exploding charge) in many pyrotechnics becomes unstable at 100°F. or above. Keep out of direct sunlight!

Pyrotechnics contain material of an extremely dangerous nature, which, if handled improperly, can be a hazard to life and property. Special safeguards for certain pyrotechnics are prescribed in *Signalman 3 & 2*. The following general precautions should be observed at all times. Make sure that all pyrotechnic precautions are understood. Ascertain that your petty officers also understand them. In this way, the leading Signalman can ensure safe handling and use at the signal station or in a boat. Understanding these precautions can save a ship from catastrophe.

- Pyrotechnics should be handled carefully. Rough handling may cause immediate functioning, or may damage the item so it fails to function properly at the time desired. Some pyrotechnics are more dangerous than service ammunition, and their proper functioning is equally important.
- Whenever possible, pyrotechnics should be stowed in the boxes or watertight containers in which they are supplied, and should be separated according to type, color, and lot number.
- Functioning of pyrotechnics is affected by moisture, hence they should be stowed in a dry, well-ventilated place. Most pyrotechnics are packed in moistureproof containers. Seals should not be broken until just before the item is to be used. Pyrotechnics exposed to moisture should be segregated until an examination proves they are safe and serviceable.
- Pyrotechnics should not be stowed where the direct rays of the sun can strike them. They should be protected from excessive and variable temperatures. Temperature in stowage spaces should be below 100°F. The main reason for this temperature limitation is that many pyrotechnic items incorporate commercial precussion-type primers containing fulminate of mercury, which deteriorates rapidly at temperatures exceeding 100°F.
- Smoke-producing pyrotechnics should be stowed above the main deck, if possible. It is difficult to combat fire if they are stowed where the smoke cannot readily blow away. Water-activated items should be stowed separately.
- Smoking or carrying lighted cigarettes, cigars, or pipes is not permitted in the vicinity of pyrotechnics. Matches and other flame- or spark-producing articles should not be carried near places where pyrotechnics are stowed.
- When a cartridge-type pyrotechnic misfires, make at least two more attempts to fire it. If it still fails to fire, the pistol or projector may be unloaded after waiting a minimum of 30 seconds. Because of the possibility of a hangfire, this rule should never be disregarded.
- The nature of pyrotechnics is such that most types deteriorate in a shorter period of time than other types of service ammunition. The oldest serviceable pyrotechnics available should be used first to ensure continuing availability of a fresh stock.
- Pyrotechnic ammunition aboard ship must be stowed securely. A loose flare, for example, may ignite and cause a serious accident. Flares are more dangerous as a fire hazard than many types of ammunition, because they are activated so easily and because of the great heat developed by burning chemical. Extreme care is necessary in stowage, use, and handling. Flares that are exposed to excessive moisture or damaged mechanically by rough handling must be returned to ammunition depots, dumped overboard, or burned in strict accordance with instructions of the Naval Ordnance Systems Command.

FLAGS AND HALYARDS

The leading Signalman must maintain custody cards on flags and halyards as well as halyard blocks. He also must ensure reasonable care in the use of flags. Strikers must not be permitted to treat them carelessly by letting flags get underfoot. Check flags at least daily to make sure they are dry. Dryness prevents rotting as well as permanent discoloration and staining from mildew. Flags should not be allowed to become soiled. Never hoist soiled or dirty flags. When steaming independently at sea in a gale, request permission to haul down the ensign to prevent it from ripping to shreds.

Name one of the petty officers to be responsible for bunting repair work. Be sure that he keeps adequate records of bunting on hand and that he orders sufficient bunting in advance to permit adequate repairs. Ensure that regular inspection is conducted and that orderly replacement of flags is made.

Before deployment, check the flag allowance in the consolidated shipboard allowance list (COSAL) and ascertain that all flags allowed are actually on board.

The leading Signalman should be extremely proud of his ship, of its appearance, and of the "can do" attitude of his gang. Dirty and mutilated flags do not contribute to a good reputation. His leadership in keeping a smart ship is invaluable to her crew.

BUNTING REPAIR EQUIPMENT

Depending upon the type of ship, bunting repair may be performed in a separate compartment, or it may be in some out-of-the-way corner. Whichever it is, ample stowage space is necessary for all spare bunting, thread, binding tape, spare parts, and the major piece of equipment–the sewing machine. A sewing machine is quite simple to operate. It is capable of sewing up to 550 stitches per minute, in lengths varying from 2 to 12 stitches per inch. It can also be used with varying sizes of needles and thread. The sewing machine is a finely adjusted piece of equipment, which may be difficult to repair on board, at a tender, or in a shipyard. Once a sewing machine is out of commission, a long wait will usually ensue before a factory repairman is available. Operation of the machine by unauthorized (and untrained) persons, or use for unauthorized purposes will hasten its rapid breakdown. To prevent having to resort to the slow, tedious process of handsewing, the sewing machine should be under sole custody of the man assigned to bunting repair.

With proper care and operation, according to the equipment technical manual, the sewing machine should give long and satisfactory service. Minor adjustments, when necessary, can be accomplished by competent ship's force personnel.

CUSTODY RECORDS

The leading Signalman should be familiar with all records kept for supplies and equipment pertaining to his department. The following topics briefly describe some of the records that are kept.

CUSTODY OF EQUIPAGE

The question of custody may prove baffling sometimes, but the leading Signalman must have a working knowledge of the various procedures concerned with custody if he is to carry out effectively his responsibilities.

In the Navy, custody relates to the physical possession of material and the assumption of responsibility for its use and care. Custody may be either actual or theoretical. To illustrate, a department head having theoretical custody is liable for such supply functions as procurement (from or through the supply officer), issue, and accounting for all material within his department. The department having actual custody or physical possession is responsible for care and stowage of the material. It is with this latter duty that Signalmen are mostly interested.

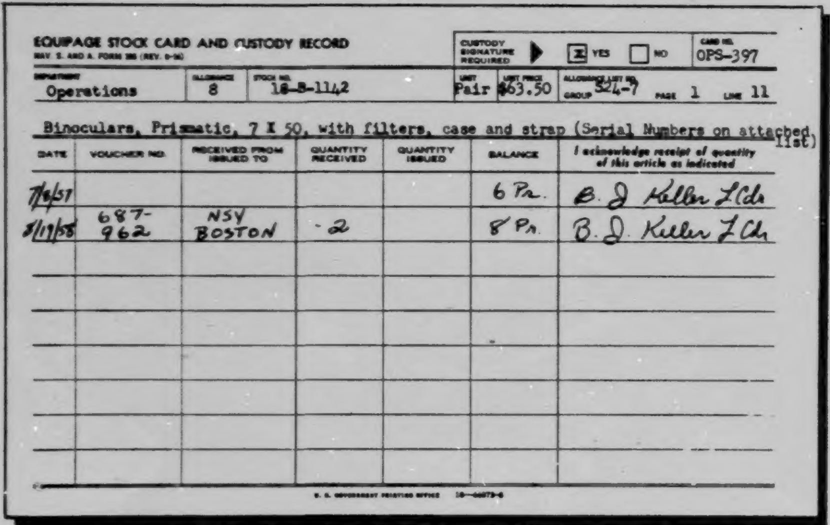
Many ships have a custody card (fig. 6-6) for every item of equipage shown in the allowance list for all departments, whether it actually is aboard or not.

The supply officer keeps a list of all equipage on board. When there is a change in department heads, the oncoming officer signs the custody cards and acknowledges receipt from the officer relieved. Division officers sign subcustody receipts for division equipage, and then usually hold petty officers accountable in the same manner for items they receive. The person signing a custody receipt for any article must realize that he is personally responsible for that article, regardless of who has immediate possession of it. Loss of any article of equipage must be reported at once to the responsible division officer.

SURVEY OF EQUIPAGE

A survey is the determination of the disposition and expenditure (from stock records and accounts) of naval material that has deteriorated, been lost, damaged, stolen, or otherwise rendered unavailable for its intended use, under circumstances requiring administrative examination into causes of the loss.

Surveys may be either formal or informal. If circumstances do not call for disciplinary action, such as losses caused by weather, unavoidable breakage, wear, or other conditions beyond control, or if the situation presents no complications, it is customary for the commanding officer to order the department head to perform an informal survey. If it appears that loss was due to neglect, carelessness, or other culpability, however, the commanding officer may order a formal survey. A formal survey is conducted by one officer or a three-member board headed by a commissioned officer. This officer or board attempts to fix responsibility for the loss.



EQUIPAGE STOCK CARD AND CUSTODY RECORD

DEPARTMENT Operations	ALLOWANCE 8	STOCK NO. 18-B-1142	CUSTODY SIGNATURE REQUIRED ☒ YES ☐ NO	UNIT Pair	UNIT PRICE $63.50	CARD NO. 0PS-397 ALLOWANCE LIST NO. GROUP 524-7 PAGE 1 LINE 11

Binoculars, Prismatic, 7 X 50, with filters, case and strap (Serial Numbers on attached list)

DATE	VOUCHER NO.	RECEIVED FROM ISSUED TO	QUANTITY RECEIVED	QUANTITY ISSUED	BALANCE	I acknowledge receipt of quantity of this article as indicated
7/8/57					6 Pr.	B. J Keller LCdr
8/19/58	687-962	NSY BOSTON	2		8 Pr.	B. J. Keller LCdr

U. S. GOVERNMENT PRINTING OFFICE

7.3

Figure 6-6.—Equipage custody card.

Disciplinary action, if warranted, may be taken against the responsible party or parties by the commanding officer. In certain instances a formal survey is required without regard to cause; e.g., ships store.

Despite the circumstances, the end result of a survey is to provide a method of expending unusable or lost material from records so that new material–not in excess of allowance–can be ordered.

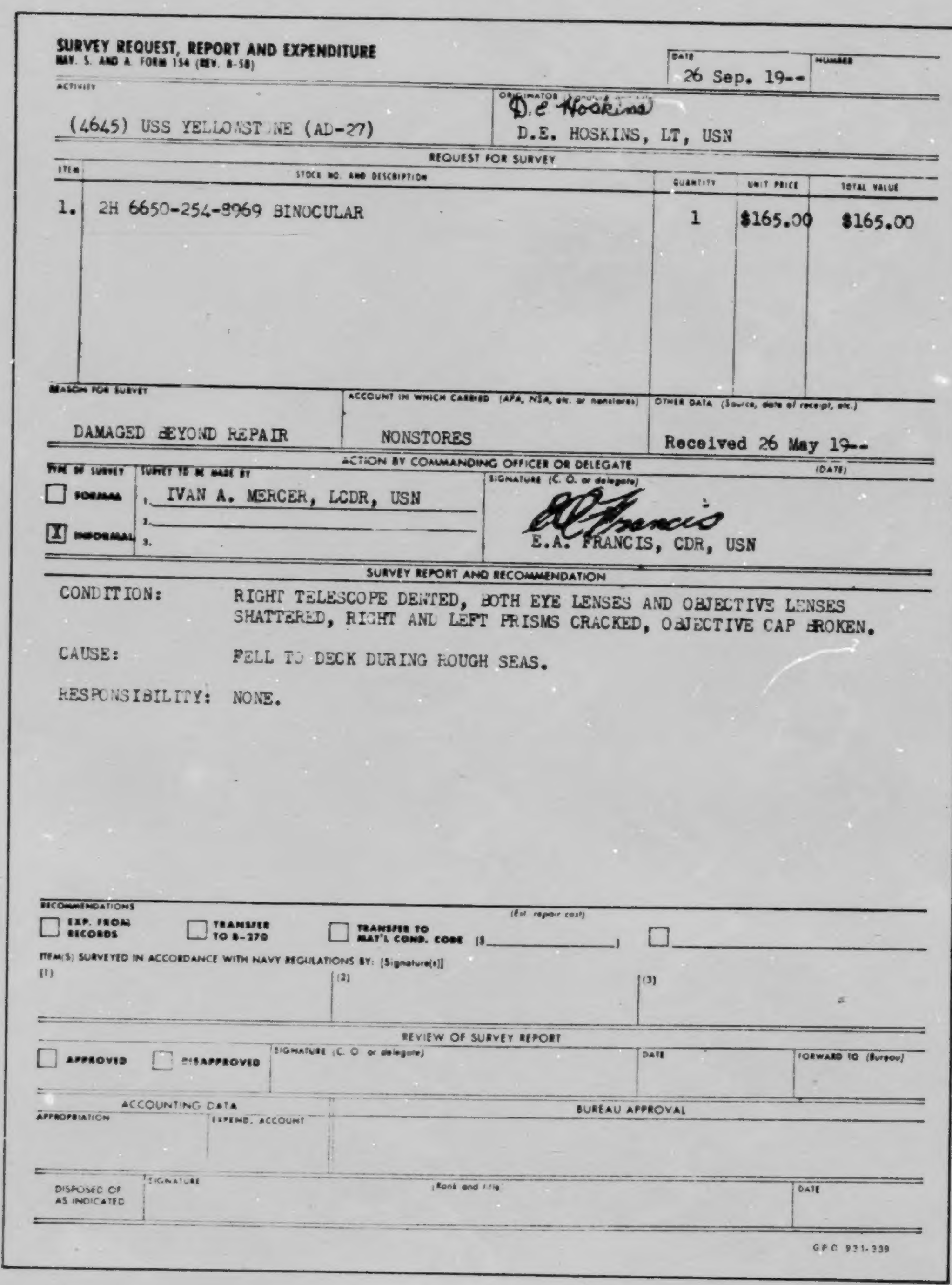
SURVEY FORM

Action on surveys should be initiated immediately upon discovering that material has become unusable. As leading petty officer, it is your job to bring any discrepancy to the attention of your division officer or department head. You should make your own investigation of the circumstances leading to the discrepancy (not to be confused with the formal or informal survey) and submit a memorandum request for survey, delineating your findings. Your report should be to your immediate superior in the chain of command and should include such information as description and stock number of the item; value of the item; reason for the request; condition of the item; cause; and responsibility. This information is used in filling out a rough copy of the Survey Request, Report and Expenditure, NAVSUP form 154.

Any person who is aware of a material condition that requires a survey may initiate a request for survey. Normally, however, the request is originated by an officer or petty officer within the department having custody of the material. Only one copy of the request (fig. 6-7) is submitted by the originator to the commanding officer. Thereafter, the survey procedure follows these steps: action by the commanding officer on the survey request; report of survey by surveying officer or board; action by the reviewing authority; and expenditure and disposal action.

MATERIAL REPLACEMENT

Each ship is allotted a quarterly allowance of funds for operation, maintenance, and repair. This quarterly allowance occasionally is divided



SURVEY REQUEST, REPORT AND EXPENDITURE
NAV. S. AND A. FORM 154 (REV. 8-58)

DATE: 26 Sep. 19--
NUMBER:

ACTIVITY: (4645) USS YELLOWSTONE (AD-27)

ORIGINATOR: D.E. Hoskins
D.E. HOSKINS, LT, USN

REQUEST FOR SURVEY

ITEM	STOCK NO. AND DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL VALUE
1.	2H 6650-254-8969 BINOCULAR	1	$165.00	$165.00

REASON FOR SURVEY: DAMAGED BEYOND REPAIR

ACCOUNT IN WHICH CARRIED (APA, NSA, etc. or nonstores): NONSTORES

OTHER DATA (Source, date of receipt, etc.): Received 26 May 19--

ACTION BY COMMANDING OFFICER OR DELEGATE

TYPE OF SURVEY:
☐ FORMAL
☒ INFORMAL

SURVEY TO BE MADE BY:
1. IVAN A. MERCER, LCDR, USN
2.
3.

SIGNATURE (C. O. or delegate): E.A. FRANCIS, CDR, USN
(DATE)

SURVEY REPORT AND RECOMMENDATION

CONDITION: RIGHT TELESCOPE DENTED, BOTH EYE LENSES AND OBJECTIVE LENSES SHATTERED, RIGHT AND LEFT PRISMS CRACKED, OBJECTIVE CAP BROKEN.

CAUSE: FELL TO DECK DURING ROUGH SEAS.

RESPONSIBILITY: NONE.

RECOMMENDATIONS
☐ EXP. FROM RECORDS
☐ TRANSFER TO B-270
☐ TRANSFER TO MAT'L COND. CODE ($__________) (Est. repair cost)
☐ __________

ITEM(S) SURVEYED IN ACCORDANCE WITH NAVY REGULATIONS BY: [Signature(s)]
(1)
(2)
(3)

REVIEW OF SURVEY REPORT
☐ APPROVED ☐ DISAPPROVED
SIGNATURE (C. O. or delegate):
DATE:
FORWARD TO (Bureau):

ACCOUNTING DATA
APPROPRIATION:
EXPEND. ACCOUNT:

BUREAU APPROVAL

DISPOSED OF AS INDICATED
SIGNATURE: (Rank and title)
DATE:

GPO 931-339

7.6

Figure 6-7.—Survey request, report and expenditure.

among the various departments of a ship by the commanding officer.

It is the responsibility of individuals, especially the leading petty officers and CPOs within the departments, to ensure that material is not wasted and that equipment is not lost or handled carelessly.

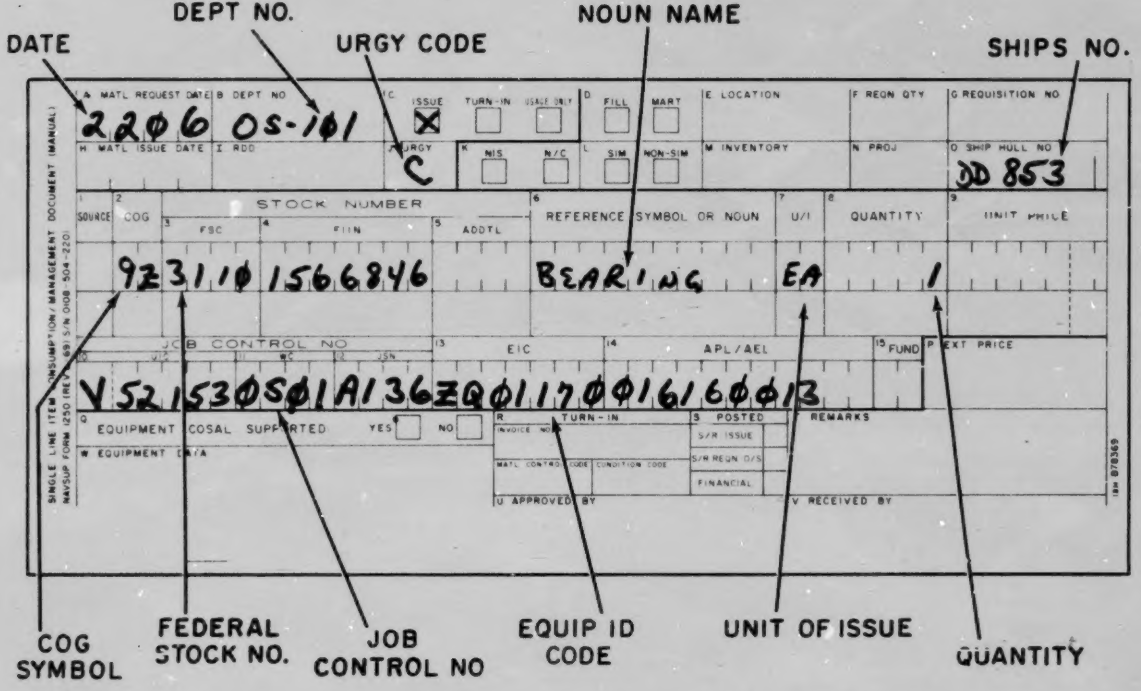
Replacement of expendable materials can be requisitioned through the supply department by means of the single line item consumption/management document, NAVSUP form 1250 (fig. 6-8). This form contains the following data:

1. Department requiring the material.
2. Date stub was prepared.
3. Signature of department head or an officer authorized by him.
4. Information properly identifying material requested for example: Union Jack, U.S., size 8; Lens paper; Light, multipurpose.
5. Quantity required.
6. Unit of quantity (number, gross, each, etc.).

Allowance lists or the stock catalog should be consulted, where possible, when filling out a stub requisition. This practice enables the Signalman to identify properly all material requested and also allows him to fill in the stock or class number. Only material or stock of one class should be entered on each stub requisition. If material is not carried in stock aboard ship, the supply officer usually requisitions the items from the nearest source of supply.

MAINTENANCE AND MATERIAL MANAGEMENT

You were introduced to the Navy Maintenance and Material Management (3-M) System in the *Military Requirements* manuals and the Rate Training Manual *Signalman 3&2.* Inasmuch as Signalmen do not usually become as involved in the 3-M system (or the Planned Maintenance Subsystem of the 3-M system) as do many other


DEPT NO.
DATE
URGY CODE
NOUN NAME
SHIPS NO.
COG SYMBOL
FEDERAL STOCK NO.
JOB CONTROL NO
EQUIP ID CODE
UNIT OF ISSUE
QUANTITY

SINGLE LINE ITEM CONSUMPTION/MANAGEMENT DOCUMENT (MANUAL)
NAVSUP FORM 1250 (REV [illegible]69) S/N 0108-504-2201

A MATL REQUEST DATE: 2206
B DEPT NO: OS-101
C ISSUE ☒ TURN-IN ☐ USAGE ONLY ☐
D FILL ☐ MART ☐
E LOCATION
F REQN QTY
G REQUISITION NO
H MATL ISSUE DATE
I RDD
J URGY: C
K NIS ☐ N/C ☐
L SIM ☐ NON-SIM ☐
M INVENTORY
N PROJ
O SHIP HULL NO: DD 853
1 SOURCE
2 COG: 9Z
STOCK NUMBER: 3 FSC: 3110 4 FIIN: 1566846 5 ADDTL
6 REFERENCE SYMBOL OR NOUN: BEARING
7 U/I: EA
8 QUANTITY: 1
9 UNIT PRICE
JOB CONTROL NO: 10 UIC 11 WC 12 JSN: V521530S01A136
13 EIC 14 APL/AEL: ZQ01170016160013
15 FUND
P EXT PRICE
Q EQUIPMENT COSAL SUPPORTED YES ☐ NO ☐
W EQUIPMENT DATA
R TURN-IN: INVOICE NO; MATL CONTROL CODE; CONDITION CODE
S POSTED: S/R ISSUE; S/R REQN O/S; FINANCIAL
T REMARKS
U APPROVED BY
V RECEIVED BY
IBM 878369

17.84

Figure 6-8.—Single line item consumption/management document, NAVSUP Form 1250.

ratings, certain details of the system are of less importance to you than to personnel whose principal duties involve equipment repair. You may become deeply involved in the system, however, if you are assigned as the administrative chief of a large operations or communication department. In such a billet, you could be in overall charge of the 3-M system, which is explained in its entirety in the effective edition of the *Maintenance and Material Management (3-M) Manual.*

MATERIAL PRESERVATION

The cleanliness and upkeep of their spaces and equipment contribute much to the smartness and efficiency of the signal gang. Because the leading Signalman tries to achieve smartness and efficiency as the overall result of the efforts of the signal gang, let's see what must be done.

An important point is that the men cannot wait for a time that can be devoted completely to upkeep. That time never comes. Similar to training, the upkeep situation requires that a little must be done every day. Some Signalmen might think of the yard or tender period as one of uninterrupted upkeep, but that is a mistaken idea. Several other duties besides upkeep must continue; e.g., training and watchstanding. Often, when steaming singly, the leading Signalman has an opportunity to square away his equipment and spaces and still attend to routine watch requirements. If, however, he knows that a 2-week tender period is scheduled on arrival in port, he might be tempted to disregard upkeep during the voyage. This practice is especially true if the ship is finishing extensive task force operations and the signal gang is physically exhausted.

The leading Signalman has no way of knowing whether SOPA will require the Signalmen for signal tower watches during the tender period. Emergency leave requests and other unforeseen events may completely ruin all upkeep plans. Local training facilities should be utilized to the maximum degree consistent with attaining a good upkeep period. The best approach is to accomplish as much work as possible while underway. Only jobs requiring special unavailable equipment or special technical help should be delayed until the tender or yard period. The scope of upkeep work supervision is as follows:

- Shipboard spaces.
- Uniforms and clothing (signal gang).
- Optical equipment.
- Bunting and halyards.
- Mechanical equipment. (The signal gang has ultimate responsibility for proper operation of signal equipment.)
- Records, files, and logs.

DIVISION SPACES

Division spaces usually consist of the living compartment, signal bridge, and bunting repair locker. Upkeep of the living compartment can do much, one way or the other, to influence efficiency of the men. A clean, well-lighted living compartment, with all details properly attended to, contributes much to the attitude, morale, and alertness of a Signalman striker before he even sets foot on the signal bridge. The leading Signalman should inspect this space at least daily to check the work of his compartment cleaner. For formal inspections of the compartment, commence preparations early and be thorough. Have a man standing by the space in a clean, proper uniform. Have him greet the inspecting party in a military manner. Remedy all discrepancies without delay.

In addition to the Captain's lower deck and upper deck inspections, the division officer must inspect all division spaces weekly and submit results of this inspection to the Captain. Normally, the division officer also makes an informal daily inspection of his spaces.

All compartments are inspected weekly except those used for carrying fuel oil, water, or other liquids, and those designated as voids, cofferdams, and double bottoms on the ship's plans.

Usually the leading Signalman accompanies the division officer on these inspections in order to get first-hand instructions on required remedial action.

On maintenance of spaces, it must be remembered, certain standards are prescribed. For instance, the types of paint for all spaces and areas are set forth in the ship's painting instructions—the type specified must be used. The ship's Boatswain and the first lieutenant retain these instructions and periodically check areas in the ship to ensure enforcement. These painting instructions must be consulted whenever there is any doubt.

Before any paint is drawn from the Boatswain, the leading Signalman must certify to his division officer that he has personally inspected the surface to be painted and that it has been prepared adequately. (Primer must have been applied correctly.) He further must assure the division officer that the paint requested from the paint locker is the correct type, that it will be applied correctly under supervision of a responsible PO, and that all paint and brushes will be returned to the paint locker at the end of the working day. Upon certifying to all the foregoing data on the paint chit, the division officer signs it, and the men can then draw the paint and brushes needed.

Nothing will give the signal bridge and living space a smarter overall appearance than good paintwork. Painting can cause a lot of difficulty, however, unless it is supervised strictly in every detail-procurement and use of handtools for preparation of surfaces, procurement and use of paint, and return of all paint and equipment used.

Inexperienced seamen often do a bad job of painting without adequate supervision. They sometimes mislay valuable handtools, and worst of all, their lack of knowledge of safety precautions can result in serious injury or death. Some of the main points on painting are outlined as follows.

- Supervise the correct application of paint to surfaces. To give such supervision, one must be familiar with materials that should not be painted–antennas, insulators, door gaskets, etc. A common problem is that inexperienced seamen can be overambitious and paint things that they should not. Or they can become careless and spray-paint everything in sight.
- Safety precautions should be observed and enforced strictly. Blowers and respirators should always be used when painting in a closed space. Beware of fire or fire-producing substances, such as open flames, lights, and the like.

DIVISION MAINTENANCE AND REPAIR

The equipment and hull spaces, under the cognizance of the OS division, are not as extensive as those in many other divisions. Nevertheless, all OS division equipment must be kept in good working order at all times. The operations officer is responsible for all repair work in the operations department and must be kept informed (through the division officer) of all required repairs as well as the progress of current repair work. The operations officer ensures that ship's force does as much as possible and that all work is accomplished as required. Overall repair and overhaul work is under the cognizance of the engineer officer, although his interest centers mainly on his own department. If help must be obtained from the engineering department, the requirements must be brought to the attention of appropriate engineering department personnel.

The engineer officer is the key man in planning and carrying out shipyard overhauls and tender availabilities, for accomplishing authorized alterations, and sometimes for obtaining outside assistance to effect emergency repairs. The engineer officer's chief aid for overhauls and repairs is the Standard Navy Maintenance and Material Management (3-M) System. The 3-M system is also the basis for scheduling repairs and serves as a complete record of what was accomplished. Some sections of the 3-M system are maintained by the operations department in accordance with ship's regulations.

Strangely enough, the main factor is unsatisfactory shipboard repairs is lack of knowledge of how to get repairs scheduled and accomplished on time. Experience shows that an improperly prepared work request usually produces inadequate repair work. Because the division leading petty officer usually makes up the initial work request, his knowledge of correct procedure is indispensable to satisfactory repair work.

At some time during an overhaul, both the division officer and the communication officer may be away from the ship for one reason or another. At such times the leading Signalman will be acting OS division officer. He must be apprised of all preliminary planning in order properly to supervise repairs in his division officer's absence. In a small ship he also needs to know about preliminary planning work for the overhaul or repair period. Where there are few officers, he is almost completely responsible for signal repair matters.

It is not enough for him merely to be included in the preliminary planning work for formal repair periods. He must be able to follow through during the entire repair period on all OS division work. He must be able to follow through either as leading Signalman or as acting OS division officer. In neither of these positions can he do a satisfactory job if he does not know about repair procedures. Little repair work is done by the signal gang. If he does not contact the right people, present them with correct information, and follow through, he probably will complete his repair period with inoperative signal equipment.

The leading Signalman must have a good working knowledge of repair procedures in his daily duties as leading Signalman. For instance, suppose there is an inoperative searchlight or infrared equipment at sea, and the work needed is beyond the capability of the ship's force. The ship can't put into port just to get this equipment fixed, and the next port she puts into may not have a shipyard. It is up to the leading Signalman to plan ahead, considering the facilities of the port, and make arrangements to restore the equipment to a proper operating condition.

Most important, the leading Signalman should have such a good understanding of correct repair procedures that he can get the OS division repair and maintenance work done in the in-port period and have sufficient time left for training and schooling his men. If he does not utilize efficient repair procedures, he will waste time for effective training. Remember, a ship needs operative equipment. Adequate maintenance and repair procedures will facilitate this requirement. Also needed are well-trained and highly skilled operators of the equipment. Time left over from effectively supervised repair jobs must be utilized regularly for training.

Rapid scientific improvements are introducing many new electronic and electrical signal equipments to the fleet. Because electrical and electronic maintenance is not part of a Signalman's rate, he cannot make these repairs himself. To repeat, he therefore must have a thorough knowledge of shipboard, tender, and shipyard repair procedures.

TENDER AND YARD WORK

Few periods within the life of a ship affect operational capabilities as much as the shipyard overhaul. The repairs and alterations that take place during the overhaul are of primary importance. The training that must be conducted during this same period is also vital. In order that the primary objective—the best possible overhaul of the ship—may be accomplished, the department heads make preparations and plans well in advance of entry into the shipyard. The tender period is similar to the yard overhaul period in that plans and preparation usually must be accomplished in the same manner.

Repairs to ships usually are accomplished by the ship's force, repair ships or tenders, and naval shipyards. Individual ships should make every effort toward self-maintenance in order to reduce the number of overhaul periods.

The main problem is to discover what repairs are necessary. A leading Signalman must systematically determine which equipments are not performing satisfactorily and will require repairs. It will therefore be necessary to get regular help from Electronics Technicians, Electrician's Mates, Machinist's Mates, and IC Electricians.

REGULAR OVERHAUL

The CNO assigns ships regular overhaul periods based upon recommendations of the fleet and type commanders concerned. Length of an overhaul and the interval between overhauls vary with different types of ships. In general, large combatant ships are scheduled to receive a 3-month overhaul about every 2 years.

Basic purpose of naval shipyards is to render service to the fleet. To carry out this function more effectively, each ship in the fleet is assigned a home yard by the Chief of Naval Operations. A home yard is defined as the shipyard at which a ship usually overhauls.

REPAIR SHIPS AND TENDERS

The chief difference between repair ships and tenders is one of function. Repair ships are concerned primarily with maintenance in support of various types of vessels or craft. Tenders, on the other hand, support in all respects specific types of ships to which they are assigned. Thus, on a repair ship there are general maintenance facilities for a number of types of craft and stocks of commonly used repair parts. Tenders have facilities for a single type of ship. Material items are peculiar to that type and other similar ships in the same squadron. A squadron of ships, moreover, relies on a tender for small quantities of special ammunition, general stores, medical facilities, and (at times, depending on the work being accomplished) quarters.

REPAIR PROCEDURES FOR REPAIR SHIPS AND TENDERS

Ships are scheduled for routine overhaul periods alongside repair ships or tenders at certain intervals of time. These intervals vary according to types of ships. Small ships usually have a tender availability period every 6 months. Normally, the time a ship spends alongside a tender or repair ship is about 2 weeks. These tender availability periods usually are planned for in advance and depend upon the quarterly employment schedule of the ship. Ordinarily, a ship knows well in advance when to go alongside a tender or repair ship for a routine availability period.

When a ship receives an employment schedule, she can begin preparations for availability period. An inspection is made to see that the current ship's maintenance project (if not replaced by the 3-M system) is up-to-date in all respects. Appropriate equipment records are used in preparing work requests for repair ship accomplishment. Work requests are typed and arranged in order of priority within their respective categories, i.e., mechanical, electrical, and hull. In tender and repair ship availabilities, alterations marked for accomplishment by forces afloat are included in the request work list.

Work requests (with required number of copies) are forwarded to the type commander or his representative. A staff officer handling material and maintenance screens the work requests. Most work request items are approved or authorized. Some items are revised so that ship's force must accomplish some of the work. A ship also may have to furnish more detailed information on certain work requests. The amount of corrective action taken by a reviewing staff officer depends on how well work requests are written and if they follow established policies or procedures. Upon completion of this screening, a ship's work requests are forwarded to the repair ship or tender.

A ship must prepare work requests in sufficient time to permit all major work items to reach the repair ship not less than 30 days in advance of arrival alongside. Where necessary, supplementary work requests should reach the repair activity not less than 10 days in advance of arrival. This procedure may vary somewhat for different naval organizations, but these requirements are customary.

Arrival Conference

When a ship comes alongside for an assigned routine availability, an arrival conference usually is held immediately. Representatives of the ships, of the repair department, and normally of the type commander are present at the conference. Relative needs of the ships and urgency of each job are settled. Jobs that have been stated indefinitely are defined specifically. An arrival conference serves to clarify all uncertainties for the repair department, which received and studied work requests in advance.

Services

For a routine availability period, the tender or repair ship provides primary services of auxiliary steam, fresh water, compressed air, and electric power. Such services as electric power and fresh water are limited in most instances. Moreover, auxiliary steam pressure, due to long steam hose lines of small diameter, is too low to operate a ship's distilling plant. Before coming alongside, ships top off their fresh water tanks and, in general, cut to a minimum their use of services from the tender or repair ship.

Normal procedure is to secure the entire engineering plant when alongside so that repairs can be accomplished without delays or interruptions. During this time, ship's force does not undertake routine jobs that would interfere with repair work.

Work Requests and Job Orders

The terms "work requests" and "job orders" sometimes are used interchangeably. This usage is not technically correct, however, because there is a difference in meaning of the two terms. Work requests are made up by a ship and forwarded through proper channels to a repair ship or naval shipyard. When a work request is approved by a repair activity, it becomes a job order. Naval shipyards, however, issue their own form of job orders when work requests are approved. In either situation, a job order is an approved work request. Approval, of course, must be made by the repair activity.

Getting Work Started

When work requests are approved at an arrival conference, jobs requiring delivery of material or parts to the tender shop should be started. The sooner repair jobs are taken to the shops, the quicker the shop crew can start work. Equipment not needed for operating the ship may be disassembled in advance so that defective parts can be delivered to the shop as soon as work requests are approved.

All material delivered to a tender should be properly tagged and identified. Metal tags secured with wire are preferred.

Tags should include the following information: ship number (and name, where practicable) department, division or space, and job order number. (The tender assigned number should be used when possible.) Additional information may be included as necessary. Reference material, such as blueprints and equipment technical manuals, should have the ship's name and number on them.

Ship-to-Shop Jobs

Many repair jobs are designated by a ship or approved by a repair activity as "ship-to-shop" jobs. This designation means that ship's force performs a large part of the repair work. Consider a pump with a damaged shaft. Ship's force disassembles the pump and removes the damaged shaft. The shaft is tagged and taken to the machine shop of the repair activity. When necessary, blueprints are also delivered. The machine shop supervisor checks on the job and gives an approximate date of completion. When the shaft is repaired or a new one made, ship's force picks it up at the machine shop and takes it back to the ship. The new or repaired shaft is installed and the pump is assembled by ship's force. Inspections and tests are made to see that all conditions are satisfactory.

Repair jobs for such items as portable signal equipment are always written up as ship-to-shop jobs. In some instances, repair jobs are written up for a repair activity to assist ship's force in accomplishing certain repairs. Many of these jobs can be called ship-to-shop jobs.

Checking Progress of Repair Jobs

A Signalman 1 or C should always keep himself informed of the progress of all repair work for his spaces and equipments. Repairs being accomplished on board a ship can be checked on easily by discussing them with the petty officer in charge of the tender repair detail. The method of checking progress of work in ships requires some planning and coordination between ship and tender. It must be remembered that personnel in tender shops are busy with their repair work. Consequently, the method used in checking progress should be one that does not interfere with personnel working in the shops.

Some tenders and repair ships have a chief petty officer who acts as a ship's superintendent. His duties in general, are to—

1. Act as liaison officer between ships alongside and the tender in regard to repair department jobs.
2. Act as a coordinator of shopwork for assigned ships.
3. Report daily to a representative of the commanding officer of the ship to ensure that work is progressing satisfactorily as far as the ship is concerned.

4. Maintain a daily progress report or chart that indicates percent completion of each job, availability of plans, equipment technical manuals, and availability of material required for each job.

5. Notify ship to pick up completed material on the tender.

6. Notify ship's personnel to witness tests occasioned by work performed on machinery, compartments, etc.

7. Obtain signatures from officers concerned if a job order is canceled.

8. Secure signatures from officers concerned on completion of job orders. Thus, where a tender or repair ship provides a ship's superintendent, progress of work on the tender can be checked easily, because own ship is furnished necessary information by the superintendent. If a ship's superintendent is not provided, it is advisable that the ship appoint a senior petty officer to perform similar duties for the OS division or operations department.

A progress chart should be obtained and filled out for all jobs to be accomplished during the repair period. This chart should be kept up to date to indicate the status of each repair job.

The main purpose of checking progress of repair work is to see that (1) jobs are not delayed unavoidably, (2) no job is overlooked or forgotten, and (3) all jobs undertaken are completed satisfactorily at the end of the repair period.

SHORE-BASED REPAIR ACTIVITIES

Shore-based repair activities include naval repair facilities and shipyards under management control of Naval Ships System Command and commercial ship repair yards under contract to the Navy.

ORGANIZATION

No standard organization is applicable to all shore-based repair activities. Although all installations have similar organizations, details depend upon various conditions. Some shore based repair activities have a more or less abbreviated form of naval shipyard organization. Others adapt their organization directly from that of a repair ship or tender. A major difference between the two types of organization lies in the existence or nonexistence of separate planning and production departments. An abbreviated naval shipyard organization has separate planning and production departments. In the repair ship or tender organization, both functions are accomplished by the repair officer and his assistants. The larger the shore-based activity, the more it conforms to a naval shipyard type of organization.

PROCEDURE FOR EFFECTING REPAIRS

The procedure for effecting repairs at a shore-based repair activity is similar to that of a repair ship or tender. Work requests proceed from an originating ship to a type commander's representative for screening. Next, they go to the local service force representative and, finally, to the repair facility.

From time to time a ship will be temporarily in places where shore-based repair facilities are available. With approval of the type commander (who furnishes funds for repairs), emergency and voyage repairs may be accomplished, depending on the time available.

120-Day Letter

Alterations for accomplishment are authorized through the medium of the 120-day letter. The term "120-day letter" is derived from the requirement that directs its issue in sufficient time to be received by action addressees 120 days in advance of the scheduled beginning date for overhaul of a ship.

The 120-day letter is issued by Naval Ship Systems Command. It notifies the cognizant type commander, planning yard, and other interested activities of the specific ship alterations, under material command cognizance, to be accomplished during the overhaul period. It normally includes the following information: work authorized, available funds, materials required, plans for accomplishing specified work, operating schedule of ship, and status of ShipAlts that already may have been started and if any material is aboard for the ShipAlts authorized.

PLANNING AND PREPARATIONS FOR SHIPYARD OVERHAUL

In addition to preparation of the shipyard work list (discussed later) the engineer officer, operations officer, and department heads provide for or make plans to cover—

1. Ship's force work.
2. Tender work list (if a tender is assigned by a type commander to assist a ship during overhaul).
3. Training personnel during overhaul.
4. Security—including protection against fire, flooding, theft, and sabotage.

- Ship's force work: All work within the capacity of a ship's force should be accomplished by members of ship's company. Cost of such work, when performed by a shipyard, ordinarily is disproportionate to the value received. A schedule of ship's force work should include names of persons responsible for accomplishment, estimated date of completion, estimated number of man-hours required, and materials and tools required from the yard. As pointed out later, copies of the ship's force work list must accompany a ship's shipyard repair requests or work lists.
- Training: Plans for training during an overhaul period should be based on the objective to be accomplished by the end of the period. Local training facilities and fleet schools should be utilized to the maximum degree, consistent with attaining a good overhaul.
- Leave: Shipyard overhaul periods give time for clearing up backlogs of leave accrued while a ship was in an operational status. Plans should provide for an equitable distribution of leave to personnel while maintaining a force of shipyard work inspectors who have the know-how to ensure satisfactory work. A period of turnovers should be arranged between return of one leave party and departure of another.
- Security: While a ship is undergoing overhaul, special precautions must be taken against fire, flooding, theft, and sabotage. A shipyard is prepared to give assistance in matters of security, but responsibility for establishing security measures remains with the ship. Plans should include the necessary organization for—

1. Precautions against fire. The greatest continuous hazard to ships in the yard is fire. Disruption of a ship's firefighting facilities and burning or welding work in progress are the most dangerous conditions contributing to fire hazards. A ship is responsible for providing fire watches, properly instructed, to each burning or welding job in progress aboard ship. All watch personnel should be instructed in the location of shipyard fire alarm boxes closest to the ship, and the current shipyard directives concerning fires and firefighting.
2. Precautions against flooding. The security plan requires frequent inspections of all unattended spaces in which possibility of flooding exists.
3. Precautions against theft and sabotage. Responsibility for security of a ship against acts of theft or sabotage rest largely with the security watches and ship's inspectors of shipyard work. Tact should be exercised in enforcing certain security measures in order that no offense is given to shipyard personnel. Such measures as routine checking of all lunch boxes and toolkits brought aboard or taken off a ship cause reactions to the detriment of overhaul work if not done through shipyard authorities.

To reduce possibilities of theft, all tools, portable signal equipment, valuables, clothing, and publications should be placed in locked stowage. Stowage spaces within the yard frequently are available to the ship for such purposes.

Acts of sabotage can best be counteracted by vigilance of watch and duty personnel. Basic requirements for security are irregular patrols through ship's spaces and proper identification of all personnel boarding the ships.

PREPARING AND SUBMITTING WORK REQUESTS

Work requests must be submitted by a ship to a shipyard in accordance with specific instructions of the appropriate fleet and type commanders. For ships not assigned to a type commander, instructions are from the commander responsible for supervision of overhaul funds.

Every department head of a ship has responsibility, according to *Navy Regulations*, of ensuring proper operation of all equipment assigned to the department. Division officers and division leading petty officers are responsible to the department head for many details connected with proper operation of equipment within the cognizance of their individual divisions.

In making up work requests, it is customary for the operations officer to require his division officers to submit rough work requests on all inoperative or malfunctioning equipment within their divisions (electronic or otherwise). The leading Signalman would therefore prepare rough work requests for all malfunctioning equipment in the OS division. The OS division officer and operations officer screen these requests before turning them over to the engineer officer. Purpose of rough requests is to ensure that no equipment is overlooked.

Work requests should be worded carefully to enable the shipyard to conduct advance planning and estimating. Requests should accurately describe conditions or symptoms that can be used to analyze the fault and decide the general extent of replacement parts and work required. Such generalities as "Requires complete overhaul, inspect and repair as necessary" are insufficient for proper analysis. Nameplate data, drawing numbers, and piece numbers or circuit symbols, and status (if known) of special material required for repairs should be included. Approved alterations equivalent to repairs ("D" type ShipAlts and those approved by a type commander), except ones designated for accomplishment by forces afloat, are to be included in shipyard work lists. Unapproved alterations, which sometimes are entered on work lists under guise of repairs, will be disapproved by the type commander.

If items concerning shaft work, vibration, or similar defects are submitted, a ship notifies a shipyard of a date in advance of arrival when shipyard technicians may board the ship for observation of conditions.

If the records are maintained properly, writing repair requests is a relatively simple matter. The usual procedure is to write work requests in rough, using the appropriate record card of a unit concerned to obtain nameplate data, plan numbers, and location data, and a description of required repair and reason therefor. After all work requests or items for a category (such as hull) are written, a priority number is assigned each item within its category. Requests are then assembled in order of priority for final typing.

PROCEDURE BEFORE ENTERING SHIPYARD

Several weeks in advance of an overhaul, the operations officer must—

1. Provide instruction to all hands in his department on objectives to be accomplished during overhaul and the part played by each individual in reaching those objectives.
2. Familiarize leading petty officers with the plan for overhaul, leave, and training.
3. Have prepared work progress charts for shipyard work and ship's force work. (Forms may be obtained from shipyard.)
4. Have prepared or procured written instructions for fire watches and security watches.

Immediately before entering a shipyard, the operations officer in conjunction with the weapons department, must take steps to dispose of pyrotechnics in accordance with shipyard directives. He must also stow and secure all pilferable equipment.

Job Orders

Upon reaching agreement at an arrival conference on each item to be undertaken, the planning department issues job orders authorizing work to be done by production shops. Each job order clearly defines the scope of work, includes complete specifications, and identifies necessary plans. Job orders are not issued for all work at the same time. Job orders issued first are for jobs requiring practically the entire availability period. Other orders are issued as soon as possible thereafter. If design plans are required for accomplishing any specific item, the job order issue date is coordinated with the planned completion date. In any event, job orders for all items approved at the arrival conference are issued by the time the one-third point in the overhaul period is reached.

Ship's Superintendent

A ship's superintendent is a naval officer attached to the production department of a naval shipyard. He acts as liaison officer between a ship and the yard. In most yards it is customary to assign one officer as ship's superintendent for each ship. A ship's superintendent can aid the ship a great deal in obtaining a successful overhaul. Principal duty of a ship's superintendent is to assist the ship in all matters regarding repair when she is in the yard. Usually he is on hand when the ship arrives. He checks to make certain that required dock services are furnished promptly. He attends the arrival conference and helps coordinate decisions.

A ship's superintendent maintains a close relationship with ship's officers and key enlisted personnel, civilian planners, shop supervisors, supervisors in charge of repair details on board ship, and other naval shipyard supervisory personnel. When delays or interferences develop on a repair job, he can check immediately with responsible yard personnel and obtain information to assist in overcoming difficulties. A ship's superintendent usually can furnish or obtain immediately any information requested by ship's force. He also can keep the ship's key personnel posted on the progress of all jobs. A ship's superintendent is available for advice on (1) repair procedures, (2) unsatisfactory work by yard personnel, and (3) tests made by the shipyard.

Ship's Progressman

A ship's progressman is a civilian assigned to the production department of a naval shipyard. He has the job of keeping a running check on the progress of all shipyard work. It is customary to assign one progressman to each ship.

In addition to keeping the production department informed, a ship's progressman keeps the ship posted on the progress of each job. A good ship's progressman, especially for a small ship, performs most of the duties assigned to the ship's superintendent. Because of his experience and knowledge of the naval shipyard, a ship's progressman is in a good position to give assistance, advice, and information on any repair problems that may arise.

Checking Progress of Shipyard Work

During a shipyard overhaul, the ship submits weekly progress reports in accordance with the type commander's instructions. The best method of keeping track of numerous repair jobs is by means of a progress chart. This chart, which can be obtained from the shipyard or naval district printing office, is kept strictly up to date. Usually, one chart is made out for shipyard work and another for ship's force work. The job order number and title are listed in left-hand columns. Right columns are marked to show percentage of completion for each job listed. One copy of a progress chart usually is posted outside the operations office, and ship's personnel keep it up to date. Many ships use the same type of progress chart for tender or repair ship availability periods.

Some naval shipyards hold a weekly repair progress conference. This conference is attended by ship's representatives as well as all interested shipyard personnel. Customarily, jobs encountering delays or other difficulties are discussed. The ship's superintendent and progressman are important yard personnel who can contribute to these conferences.

In checking on progress of a job, one must have detailed information of work to be accomplished. This information is obtained from job orders issued by the planning department. Copies of job orders applicable to a specific division usually are kept by that division officer.

Additional Repair Jobs

As a routine step, it is necessary to prepare supplementary repair lists to include items arising subsequent to submission of original lists. Additional repairs are sometimes required because of recent voyage casualties, or because of conditions discovered during shipyard tests and inspections.

In the period (approximately 3 months) between submission of original work lists and a ship's arrival at a shipyard, there might be some unforeseen difficulties that will require shipyard repairs. These requests are forwarded on the first supplementary work list. This list should be completed before the ship's arrival at the yard.

The shipyard holds numerous tests and inspections in accordance with an established policy and ship's request items. These tests and inspections may bring out some unknown repair items. Usually when these initial tests and inspections are completed, a supplementary repair list is made out to cover any defects that were found. This repair list is called the 1st or 2nd supplement, as applicable.

INSPECTION DUTIES OF SHIP'S FORCE

Inspection of work is the responsibility of both the repair activity and the ship. A repair activity should require such inspections as ensure proper execution of work and adherence to prescribed specifications and methods. A ship makes such inspections as may be necessary to determine if work is satisfactory, but during its progress and when completed.

A responsible Signalman 1 or C should schedule his work in such a manner that he is free at all times to inspect and check the progress of work involving his spaces and equipments. A check should be made to see that required tests are made by the shipyard before a job is considered fully completed. A job order lists any tests that must be made by yard personnel.

If unsatisfactory work is performed by shipyard personnel, follow instructions of the engineer officer. Talking it over in a friendly manner with workmen usually solves the problem. If it doesn't, notify a division officer or operations officer, who can take up problems of unsatisfactory work with the ship's superintendent. In exceptional cases the commanding officer of a ship can take action in accordance with type commander instructions.

In many ships it is customary for a division officer or operations officer to check with the leading Signalman before he signs completion of a job order. By continuous inspection of shipyard work and checking off jobs completed satisfactorily, one can furnish required information without unnecessary delays.

PLAN FOR LEAVING SHIPYARD

Planning relative to completion of overhaul must be detailed carefully and must cover the final weeks of the overhaul. Planning should provide for–

1. Completion of all repairs and alterations.
2. Postrepair tests of machinery and equipment.
3. Basic loading of equipage, repair parts, stores, provisions and fuel.
4. Return of personnel from school and leave.
5. Training personnel in preparation for the dock trial, post-repair sea trials, and/or postoverhaul operations.
6. Completion of postrepair trial and posttrial repairs and adjustments.
7. Check for deficiencies, utilizing training command arrival inspections checkoff list and type commander administrative inspection checkoff lists.

Readiness for Sea Period

A basic readiness for sea (RFS) period of 7 days is established for all active ships, commencing immediately after completion of a regular shipyard overhaul period. The RFS period may be varied by the type commander, as necessary, for a specific ship. An RFS period is assigned for the specific purpose of allowing the commanding officer sufficient time for preparing his ship for sea. Shipyard work, therefore, unless it is of most urgent nature and authorized by the type commander–may not be performed during this period. Plans for the RFS period should provide for timely accomplishment of–

1. Degaussing and depermining, if required.
2. Adjusting of magnetic compasses.
3. Radar range calibration.
4. Calibration of radio direction finder.
5. Structural test firing of newly installed armament.
6. Operation at sea for machinery tests.
7. Loading of ammunition.
8. Completion of loading of equipage, repair parts, stores, provisions, and fuel.
9. Testing all repaired and newly installed visual equipment.
10. Other adjustment and calibration of ship's equipment, as required.

CHAPTER 7

ASSISTING OOD

First Class and Chief Signalmen often are designated junior officer of the deck (JOOD) of large ships. Aboard smaller ships they may even be required to stand OOD watches. Such duties are serious responsibilities. This chapter describes the various duties required in performing these assignments.

OFFICER OF THE DECK

The officer of the deck is one of a group of line officers (sometimes including Marine officers in port) designated by the commanding officer to relieve one another standing watches in charge of the ship. In substance, *Navy Regulations* has this to say about the OOD:

1. The officer of the deck is the officer on watch in charge of the ship.
2. The officer of the deck is responsible for the safety of the ship, subject, however, to any orders he may receive from the commanding officer.
3. Every officer or other person on board the ship, whatever his rank, who is subject to the orders of the commanding officer (except the executive officer and, if the CO desires, the navigator or any other officer the CO may designate), is subordinate to the officer of the deck.

OOD UNDERWAY

A relieving OOD arrives on the bridge at least 15 minutes before his watch begins (considerably earlier if ship evolutions are taking place). He arrives early in order to acquaint himself with the situation before actually assuming responsibility.

An officer about to relieve the deck must make himself thoroughly acquainted with the position of the ship with reference to vessels in sight and with reference to any land, shoals, or rocks nearby; with the general state of the weather; course and speed; main engines and boilers in use; all unexecuted orders; special orders or night orders of the commanding officer; condition of running lights and other appliances required by law to be in operation or at hand in order to prevent collisions; readiness of the watch on deck available for duty; and the general condition of the ship. When the ship is in formation, he must ascertain, before relieving, that she is in her proper station. If she is out of station, he may decline to relieve until he reports the fact to the commanding officer and receives his orders.

The OOD may also refuse to relieve if the oncoming watch is not yet up and ready for duty. If the ship is in a perilous position, he may decline to relieve until he reports the fact to the commanding officer and receives his orders. He should not relieve until he obtains the following data.

1. Tactical information:
    a. Formation, prescribed distance, and interval
    b. Order of ships and, if in column, whether the ship is odd or even.
    c. Identity and location of guide.
    d. True, magnetic, gyro, and standard compass courses.
    e. Standard speed and speed being made at the time of relief.
    f. Reserve speed available, and any special orders concerning speeds to be used.
    g. Stationkeeping data, such as amount and frequency of changes in revolutions per minute required to keep station; rudder being carried, if any; difference between prescribed course and course made good.
    h. Condition of readiness of such equipment as ready lifeboat, searchlights,

  breakdown flag, Very pistol, and rockets.
  i. Limitations of lights, whistle, etc., if any.
  j. Condition of radars.
2. Navigational information:
  a. Position of ship on the chart.
  b. Land or aids to navigation then in sight or likely to appear.
  c. Bearings and soundings taken or ordered.
  d. Weather expected.
  e. Any usual condition, such as a strong current experienced or expected.

NOTE: For night watches, the OOD should read and initial the captain's night order book.

3. Ship formation:
  a. Condition of readiness set.
  b. Status of lookouts, sea details, watch on deck, and leadsman, if required.
  c. Ready lifeboats and lifebuoy.
  d. Condition of ground tackle, air ports, ventilators, watertight doors, and the like.
  e. Location of commanding officer, navigator, and flag officer (if any).
  f. Drills, exercises, or ship's work scheduled during the watch.
  g. Boilers and machinery in use, and those out of commission, if any.
  h. Status of prisoners.
  i. Any standing or unexecuted orders.

Responsibilities of the OOD underway are summarized as follows:

1. At sea, especially when approaching land or when in pilot water, the officer of the deck keeps himself informed of the position of the ship; whether land or lights are in sight or if either are likely to be seen; and of all other particulars that may be of use to him in keeping the ship out of danger. If approaching land or shoals, he keeps leadsmen in the chains and watch on fathometer, and has the anchors and chains clear and ready for use.
2. He remains in charge until regularly relieved, and does not become occupied in any manner that may distract his attention from duty.
3. He must see that the watch is alert at all times, at their stations, attentive, and ready for duty; that every possible precaution is taken to prevent accidents; that a boat is always ready for lowering and the lifebuoys ready for letting go; that lookouts are in place and vigilant, and that they understand their duties. He must exercise great care that the ship is steered skillfully and kept on her course. He must keep correct account of course and speed made. Running lights must be kept bright from sunset to sunrise, and their condition must be reported every half hour. He must ensure that precautions are taken at all times as required by law, to prevent collisions. When in pilot waters, he must see that leads are kept going, or that other means for ascertaining soundings are available and are used frequently.
4. When in company with other ships, he must be careful to keep station. If unable to do so, he must report at once to the commanding officer.
5. When the commanding officer is on the navigating bridge, the officer of the deck must not change course, alter speed, nor perform important evolutions without consulting him, unless prior permission was given or time does not permit.
6. He promptly reports to the commanding officer all land, shoals, rocks, lighthouses, beacons, buoys, discolored water, vessels or wrecks discovered, and all changes in weather or shifts of wind; all signals made; all changes of speed, formation, or course by the officer in tactical command or by ships in company; any change in course or speed made by himself; any marked change in barometer, force of wind, sea state, or marked indications of bad weather; display of storm signals on shore; all serious accidents, winding of chronometers; hours of 0800, 1200, and 2000 meridian time; latitude at meridian, if obtained; movements of men-of-war, and other vessels; and, in general, all occurences worthy of notice.

7. He must not, unless to avoid immediate danger, change course without directions from the commanding officer, and then he must report the change to him as soon as possible. He must regard advice from the navigator as sufficient authority to change course, but must report change at once to the commanding officer.
8. In time of war, or when hostilities may be expected, he makes no dispositions that will interfere with the immediate use of armament. Anytime he sights a suspicious ship or other object that may possibly have a hostile purpose, he instantly makes preparations for battle, and informs the commanding officer.
9. Except to warn ships of immediate danger, he makes no official signal, either by day or night, without authority from the commanding officer. He must see that a good lookout is kept for signals; that none is answered until understood; and that authorized equipment is at hand for making signals of all kinds and ready for use, night and day. Also, he ensures that all signals and official messages (including those transmitted orally) sent or received are recorded immediately, and that notations are made of the times and the vessel(s) or station to or from which the signals are made.
10. When danger of collision exists, he immediately sounds the collision alarm.
11. He requires the coxswain of the lifeboat crew of the watch to make a verbal report on the condition of the boats at the beginning of each watch.
12. He ensures that the damage control PO of the watch, or other person detailed for that purpose, makes the rounds of the ship, visiting all accessible parts below the main deck at prescribed intervals after taps, and until all hands are called in the morning. During these rounds, the damage control PO of the watch sounds voids to check for flooding, and reports his results to the officer of the deck.
13. The officer of the deck must carry out all instructions pertaining to the daily routine, if weather and other circumstances permit, modifying instructions (as necessary) to comply with orders of the commanding officer and executive officer.
14. When the bell or bugle of the flagship or senior ship can be heard, ships follow her in striking the bell and in routine evolutions.

PREPARATIONS FOR ENTERING PORT

The OOD of a ship entering port directs that entry plans be made suitably in advance. Of the preparations for which he is responsible, he—

1. Notifies the engineroom, as far in advance as possible, of the time of anchoring. He also notifies the executive officer, weapons officer, and engineer officer.
2. Directs disposal of garbage and other refuse that may be thrown overboard if beyond the 3-mile limit.
3. Orders boats prepared for lowering, with running lights ready if necessary.
4. Makes sure that ground tackle and forecastle are prepared for anchoring, for mooring, and the like, as necessary.
5. Announces which side is going to the dock, if the ship is going alongside, and orders lines, fenders, heaving lines, and line-throwing guns prepared on that side.
6. Instructs that accommodation ladders and booms be rigged and prepared for going out immediately upon anchoring.
7. Orders batteries, searchlights, booms, cranes, and other equipment not in use, to be secured in the prescribed position for entering port.
8. Ensures that boat covers, hatch covers, awnings, and other canvas are stowed properly, and that slack rigging is hauled taut.
9. Directs that the boatswain's mate of the watch pipe down all bedding and see that nothing is hanging over the side or dangling on the lifelines.
10. Passes the word for the crew to shift into the uniform of the day. Personnel not working are sent to quarters at designated time.

11. Directs preparations for rendering honors, as necessary.
12. Stations details at the colors for returning salutes, shifting colors, and hoisting the jack upon anchoring. If entering port at night, stations detail ready to turn on anchor lights.
13. Ascertains that working parties, stewards, mail orderlies, and others who are to leave the ship upon anchoring, are ready to depart instantly.

OOD IN PORT

Before relieving the watch in port, the OOD obtains information about the–

1. Anchor in use and scope of chain.
2. Depth of water and condition of the chain in the hawse.
3. If alongside, what lines are in use.
4. Anchorage bearings.
5. Weather conditions to be expected, and preparations to be made.
6. State of tide.
7. Boiler and auxiliaries in use.
8. Senior officer present afloat, and other ships present.
9. Location of flag officer (if any), captain, executive officer, and department heads.
10. Senior officer aboard and senior duty officer.
11. Boats in the water and their location; boat officers available.
12. Absentee, prisoner, and duty lists.
13. Appearance of ship.
14. Orders for the day and special orders.
15. Liberty section, time of expiration of liberty, and number of men ashore.
16. Guardship.
17. Status of planes.
18. Work or drills in progress or scheduled.
19. Visitors on board or expected, and orders concerning same.
20. Workmen on board, if any.
21. If at night, ready lifeboat designated and anchor watch morning orders.
22. Boat schedule.

To summarize, the OOD in port is responsible for the–

1. Safety and security of the ship.
2. Safety of personnel, boats, planes, and other material.
3. Readiness of the ship for duty.
4. Smart appearance of ship, boats, and crew.
5. Comfort of crew.

GETTING UNDERWAY

A typical checkoff list from a ship's organization book affords a good idea of the duties of the OOD in getting underway. In general, he must–

1. Notify department heads.
2. Pass the word: "All hands make preparations for getting underway at____(time)."
3. Order the word passed: "See material condition Yoke Modified."
4. Make certain that all boats, mail clerks, stewards, etc., have returned or were notified to return to the ship. Make the general recall signal, if necessary.
5. Direct that boats be hoisted in, last boat to be aboard approximately 15 minutes before getting underway. Permission to pick up last boat should be obtained from the executive officer.
6. Station special sea detail 30 minutes before getting underway. Order all hands to change into uniform of the day before setting sea detail.
7. Order boat booms and ladders (rigged in after boats) hoisted aboard.
8. Ascertain that the steering gear, engine order telegraph, telephone circuits, and the like have been tested. Obtain permission from commanding officer to test main engines.
9. Ensure that all department heads made readiness reports for getting underway 30 minutes before sailing time.
10. Shift the watch from quarterdeck to bridge.
11. Ensure that required number of boilers are in use.
12. Report immediately any delay in getting underway to the executive officer or commanding officer. Report readiness for getting underway to both officers.
13. Ascertain, if at night, that searchlights are manned and ready for use.

14. Ensure that all service connections are disconnected from the pier and other ships.

15. Test the whistle.

JUNIOR OFFICER OF THE DECK (UNDERWAY)

Senior petty officers on destroyers and smaller craft are required to perform many duties, which in larger ships, are assigned to junior officers. In view of this practice, senior petty officers should prepare to stand junior officer of the deck underway.

Basic function of the junior officer of the deck underway is to assist the officer of the deck in performing his duties.

DUTIES OF JOOD

A junior officer of the deck (JOOD) must be thoroughly familiar with the ship's organization and regulations manual, particularly those portions pertaining to emergency situations.

During tactical evolutions and, in fact, whenever a situation requires extraordinary alertness, the JOOD should be stationed on the side of the bridge away from the OOD. At such times it is imperative that he maintain close observation of other ships and prevent a dangerous situation from developing.

A junior officer of the deck must be prepared to decode and interpret tactical signals, and should advise the OOD of any variation he may note between his own interpretation and that supplied by CIC. He also must be prepared to develop maneuvering board solutions whenever required by the OOD, or as a check on information supplied by CIC. Moreover, he should be familiar with voice radio procedure and with the use of all equipment on the bridge.

Classified publications must be accounted for and inventoried by each watch. This responsibility usually is assigned to the JOOD.

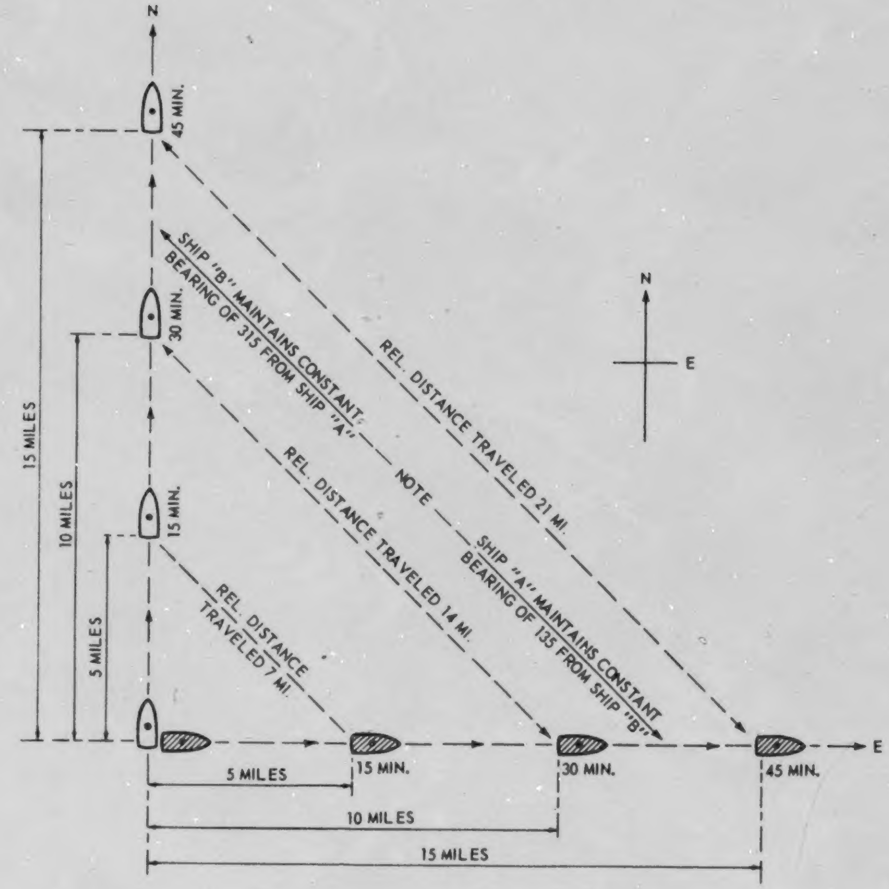
Unless otherwise agreed upon, military protocol demands that passing honors (honors rendered by a ship) be exchanged between embarked officials in units passing close aboard. In general, honors are rendered by sounding "Attention" and ordering a hand salute by all persons in view on deck who are not in ranks. Honors between ships are originated by the ship in which the junior official is embarked. Periodically, each fleet commander in chief promulgates the administrative organization of his fleet, indicating the seniority of all commanding officers and other high-ranking officials. It is imperative that every JOOD be familiar with the fleet administrative organization. When passing honors are to be rendered, he must be ready to notify the OOD immediately which ship is junior.

MANEUVERING BOARD

A maneuvering board is essentially a compass rose containing a nomogram (a combined speed, distance, and time scale). Use of a maneuvering board facilitates graphic solution of relative movement components of ships moving or maneuvering in formation. A plotter may compute distances, courses, and speeds required for various evolutions as well as closest point of approach of other ships to own ship. Solutions of maneuvering board problems are fairly simple when fundamentals of relative motion are understood.

RELATIVE MOTION

Geographical (true) motion is the movement involved in a change of geographical position, as when an automobile travels from New York City to Kansas City. Relative motion, on the other hand, is the combined result of the geographical motion of moving bodies. Suppose two ships sail from the same anchorage, one heading north and the other east, both making 20 knots. Disregarding set and drift (amount each is offset by wind and/or current), each has a geographical motion of 5 miles in the first 15 minutes. At the end of that time, they are 7.07 miles apart. Although each ship travels only 5 miles, their distance of relative movement is 7.07 miles. This relationship is illustrated in figure 7-1. Notice that at the end of 30 minutes each ship has traveled 10 miles on her respective course. Corresponding distance of relative movement is 14.14 miles. At the end of 45 minutes the Relative Distance Traveled is 21.2 miles.


N
45 MIN.
30 MIN.
15 MIN.
15 MILES
10 MILES
5 MILES
SHIP "B" MAINTAINS CONSTANT BEARING OF 315 FROM SHIP "A"
NOTE
SHIP "A" MAINTAINS CONSTANT BEARING OF 135 FROM SHIP "B"
REL. DISTANCE TRAVELED 21 MI.
REL. DISTANCE TRAVELED 14 MI.
REL. DISTANCE TRAVELED 7 MI.
N
E
E
15 MIN.
30 MIN.
45 MIN.
5 MILES
10 MILES
15 MILES

58.89

Figure 7-1.—Relative movement.

RELATIVE MOVEMENT PLOT

By means of a relative movement plot, both actual motion and motion relative to a moving point (relative movement) may be determined.

If all ships in a formation are proceeding at the same speed along the same course, they remain stationary relative to one another. In other words, they have no relative movement. If one ship forges ahead or drops behind, however, that ship has movement relative to the others in the formation, and they have movement relative to it, even though the other ships remain on their former course and continue to run at the same speed. Relative movement, then, occurs only when the actual movement between two or more units is not the same.

RELATIONSHIP OF RELATIVE MOVEMENT TO NAVIGATIONAL PLOTS

Figure 7-2 shows ship A proceeding on course 000° at a speed of 15 knots, while ship B is on course 026.5° at speed 22 knots. When ship A is at A_1, ship B is at B_1; when ship A is at A_2, ship B is at B_2, and so on. The full lines represent navigational plots of these two ships. Their bearing and distance at any time can be determined directly by measurement.

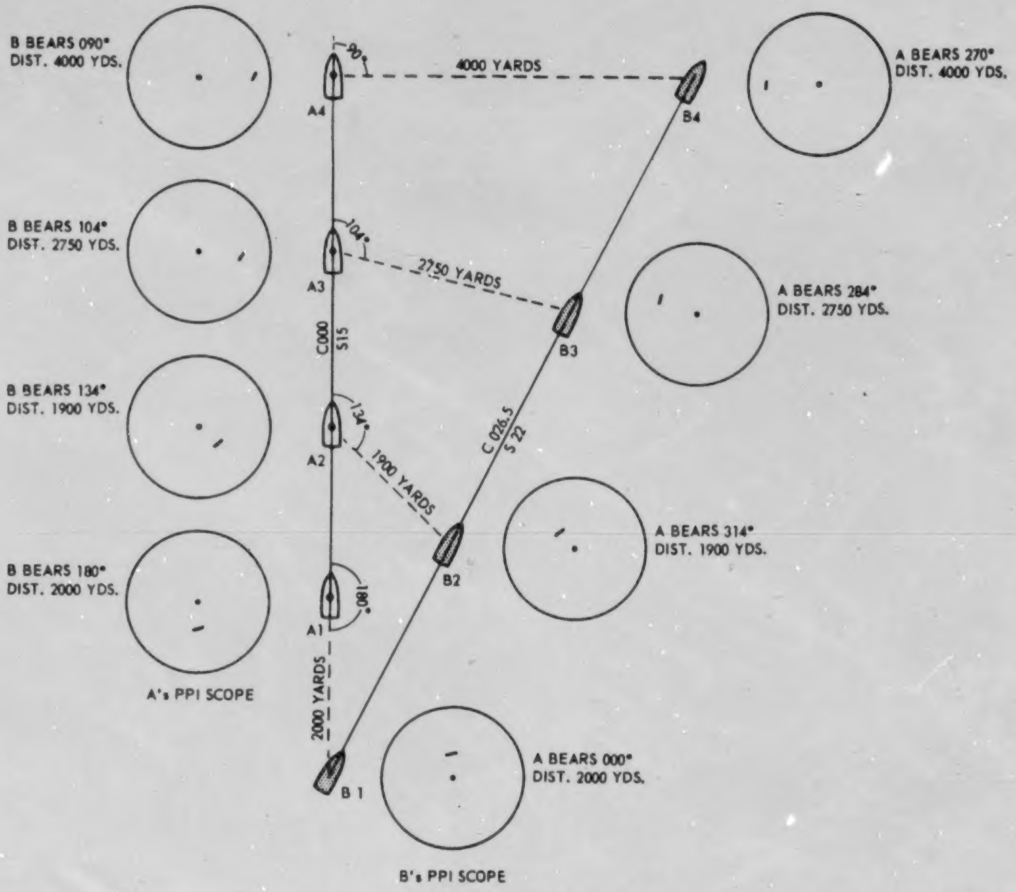


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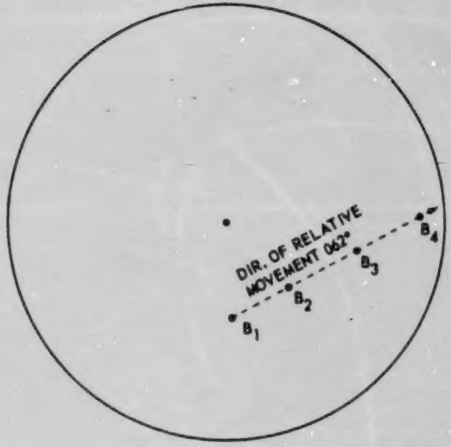
Figure 7-2.—Relative movement on a navigational plot.

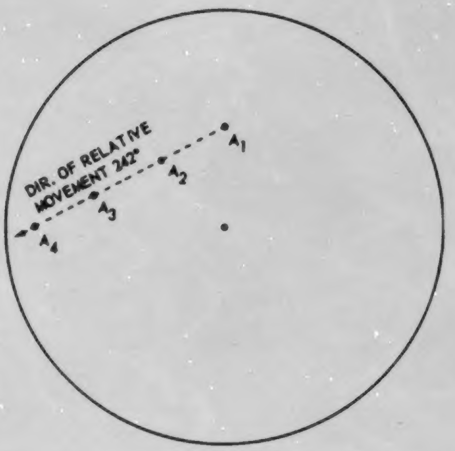
In figure 7-3 various positions shown in figure 7-2 are presented on a plan position indicator (PPI) scope for each ship. Note that they form a straight line. It can be seen that although ship B is actually on course 026.5°, her movement relative to ship A is in the direction 062°. Similarly, the direction of relative movement of ship A with respect to ship B is the reciprocal of this direction, or 242°, although ship A is actually on course 000°. The PPI scope permits visualization of relative movement, inasmuch as all positions of the target ship on the scope are relative to own ship. Hence, motion observed on the PPI scope is relative movement. True motion is seen on a PPI scope only when own ship is stationary. When a PPI scope has gyro input, however, a contact appears on the scope at its true bearing.

PARTS OF RELATIVE MOVEMENT PLOT

The relative movement method of plotting consists of two distinct but related parts: a relative plot and a vector diagram (or speed triangle). If problems are to be solved intelligently, the function of each line and each point, as well as their relationship to every other line and point, must be understood clearly.



A'S PPI SCOPE



B'S PPI SCOPE

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Figure 7-3.—Relative movement on a radar PPI scope.

Relative Plot

Note, in figure 7-3, that the ship on which radar is mounted, remains at the center of the PPI scope. In the relative plot, then, the following rule applies: The ship with respect to which relative movement is to be shown remains fixed on the plot.

The fixed ship, termed reference ship, is placed at the center of the diagram and is labeled *R* (fig. 7-4). Because plotters are interested chiefly in the position of other ships with respect to own ship, it is often preferable to designate own ship as reference ship. If in formation, however, and maneuvering with respect to the guide ship, the guide should be designated as reference ship. It follows that any ship except a reference ship is shown in a different position on the plot. Any ship besides a reference ship is called a maneuvering ship and is labeled M_1. At the end of a maneuver, its position is labeled M_2. When more than two positions of a maneuvering ship are of interest, they are labeled M_1, M_2, M_3, and so on.

Figure 7-4 illustrates the situation in figure 7-2, with ship A as reference ship and ship B as maneuvering ship. Line M_1M_2, called the relative movement line, aids in finding—

1. Direction of relative movement (DRM) of the maneuvering ship with respect to reference ship. The DRM is from M_1 toward M_2.
2. Distance of relative movement (MRM) (by its length).
3. Closest point of approach (CPA) of the maneuvering ship to reference ship. (The CPA is determined by measuring the length of a line drawn from *R* perpendicular to the M_1M_2 line, as in figure 7-5.) The bearing and time of occurence must also be given with the length of the line because CPA is defined by all three elements (bearing, range, and time).

Vector Diagram (Speed Triangle)

A vector diagram, frequently referred to as a speed triangle, is illustrated in figure 7-6.

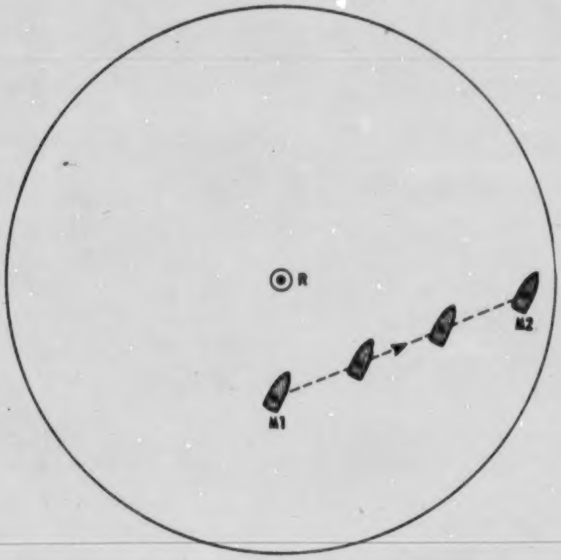

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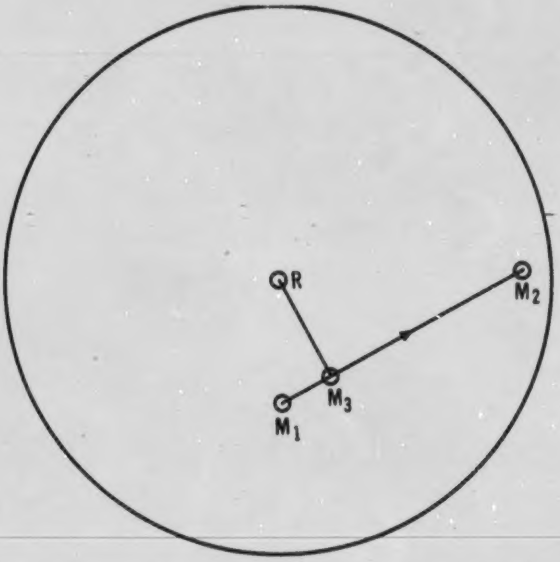
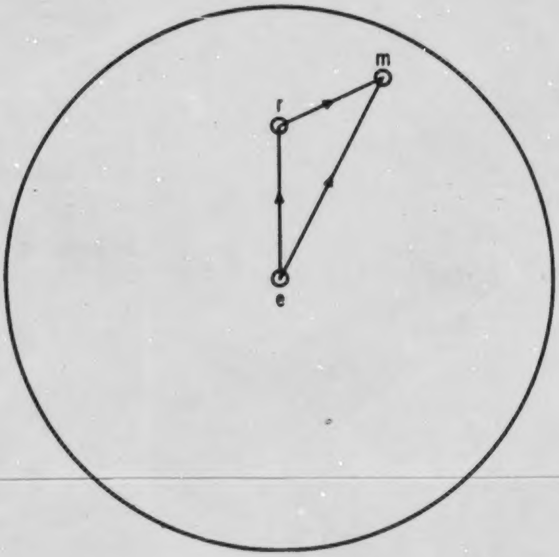
Figure 7-4.–Elements of a relative plot.



112.41
Figure 7-6.–Vector diagram.



112.40
Figure 7-5.–Closest point of approach.

Courses and speeds may be determined by using a speed triangle. A speed triangle is composed of three vectors, representing–

1. The *er* vector.
   a. True course of reference ship, indicated by the direction of line *er*.
   b. True speed of reference ship, indicated by length of line *er*.
2. The *em* vector
   a. True course of maneuvering ship, indicated by the direction of line *em*.
   b. True speed of maneuvering ship, indicated by the length of line *em*.
3. The *rm* vector.
   a. Direction of relative movement of maneuvering ship with respect to reference ship, indicated by the direction of line *rm*.
   b. Relative speed, or speed of maneuvering ship relative to reference ship, indicated by the length of line *rm*.

As can be seen, each line (or vector) represents both direction (course) and speed. The diagram must be labeled properly for correct interpretation.

RELATIONSHIP BETWEEN RELATIVE PLOT AND SPEED TRIANGLE

Note that direction of relative movement (DRM) is indicated by both the relative movement line M_1M_2 of the relative plot and the vector *rm* of the vector diagram. (See fig. 7-7.) Both the relative movement line and the *rm* vector represent direction of relative movement, hence they must be parallel in every instance.

The function of each diagram must be kept clearly in mind. A relative plot indicates bearings and distances. A speed triangle shows courses and speeds and relative direction and speed.

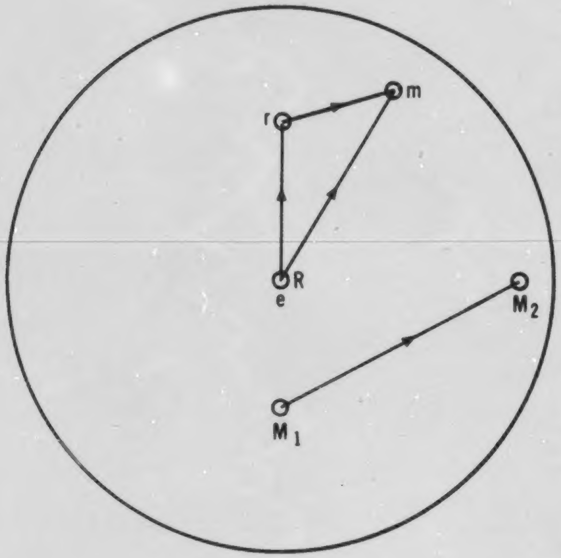


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Figure 7-7.—Complete relative movement plot.

USING MANEUVERING BOARD TO SOLVE PROBLEMS

A plotting sheet, prepared by the Oceanographic Office, facilitates solution of relative movement problems. A maneuvering board is illustrated in figure 7-8.

A mechanical maneuvering board that further expedites the process of solving relative movement problems has been developed by Naval Air Systems Command. Full instructions are provided with each instrument. (See fig. 7-9.)

Maneuvering boards are printed with radial straight lines (to aid in plotting bearings and courses) and concentric circles (to aid in plotting distances and speeds).

The maneuvering board has two sets of bearings printed along its outer circle. The outer numbers represent true bearings, and the inner set of numbers is printed as an aid in finding reciprocal bearings quickly. Notice in figure 7-8 that there are 10 circles. These circles represent units of distance, and may be used to form a scale.

Ratio scales are provided on the left and right sides of the maneuvering board (fig. 7-8) for convenience in adopting a suitable reduction for quantities pertaining to the problem at hand.

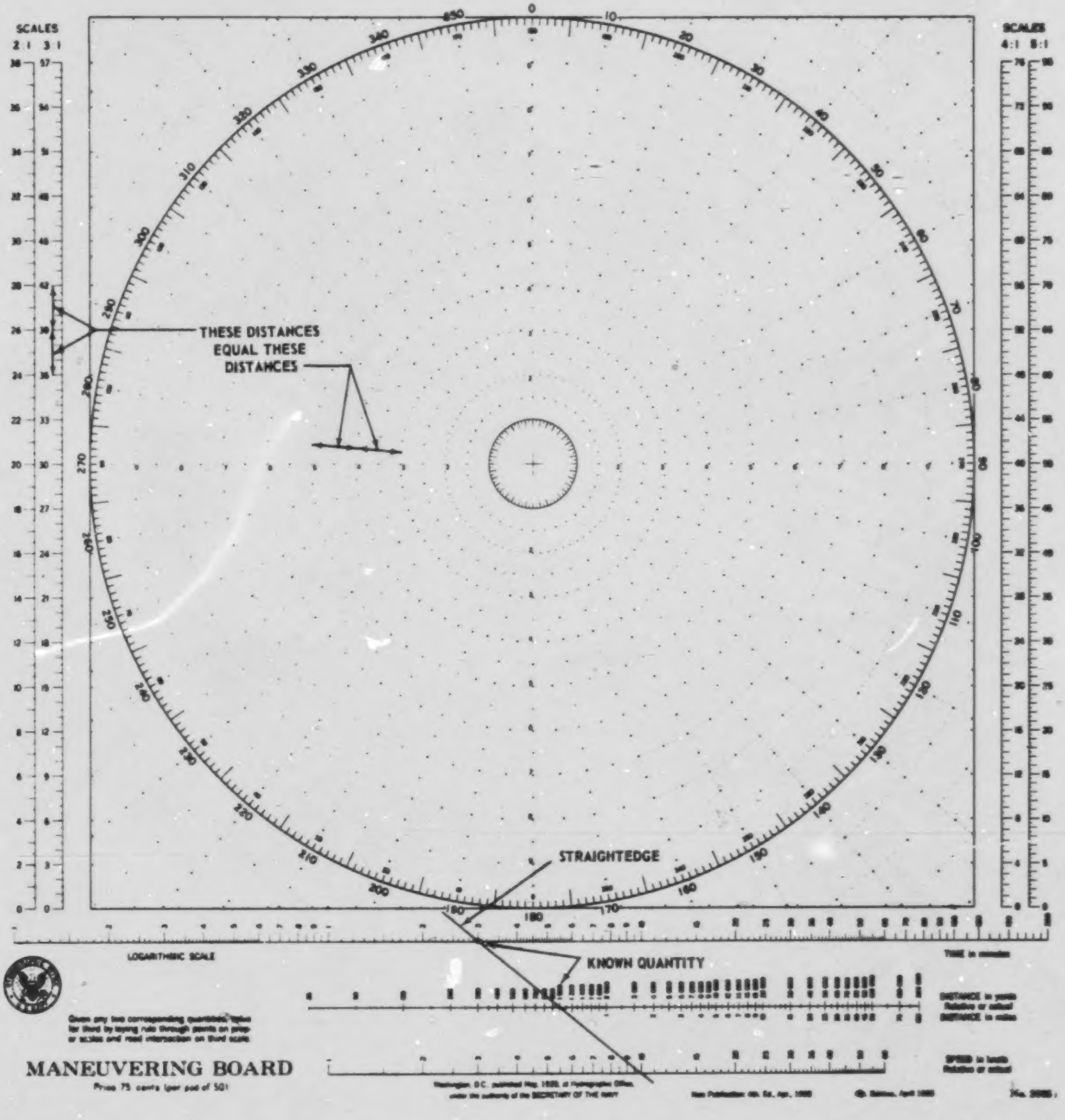
Numerical spacing on each scale is proportionate to that of the circle in the plotting area. When selecting one of these scales, the distance of each circle must be amplified accordingly. For example, when using a 1:1 scale (circle spacing in plotting area) with each circle representing 1000 yards, the 5 circle represents 5000 yards. If the 2:1 scale is used, the 5 circle would represent 10,000 yards (5000 x 2).

Ordinarily, the distance between circles on the maneuvering board represents from 1000 to 5000 yards in the relative plot, and 1 to 5 knots in the vector diagram. Any scale may be selected if it is adequate and convenient to include all required ranges and speeds within the 10 concentric circles on the board.

Deciding the correct range scale to use is comparatively easy. There are 5 different scales, so the maximum range for these scales would be 10 (units of distance for the 1:1), 20 (units for the 2:1), and so on. Thus, if range to a contact is 14,000 yards, the 2:1 scale can be used, because this range falls between 10,000 and 20,000 yards. The accompanying table is designed to assist in selecting range scale. If range is—

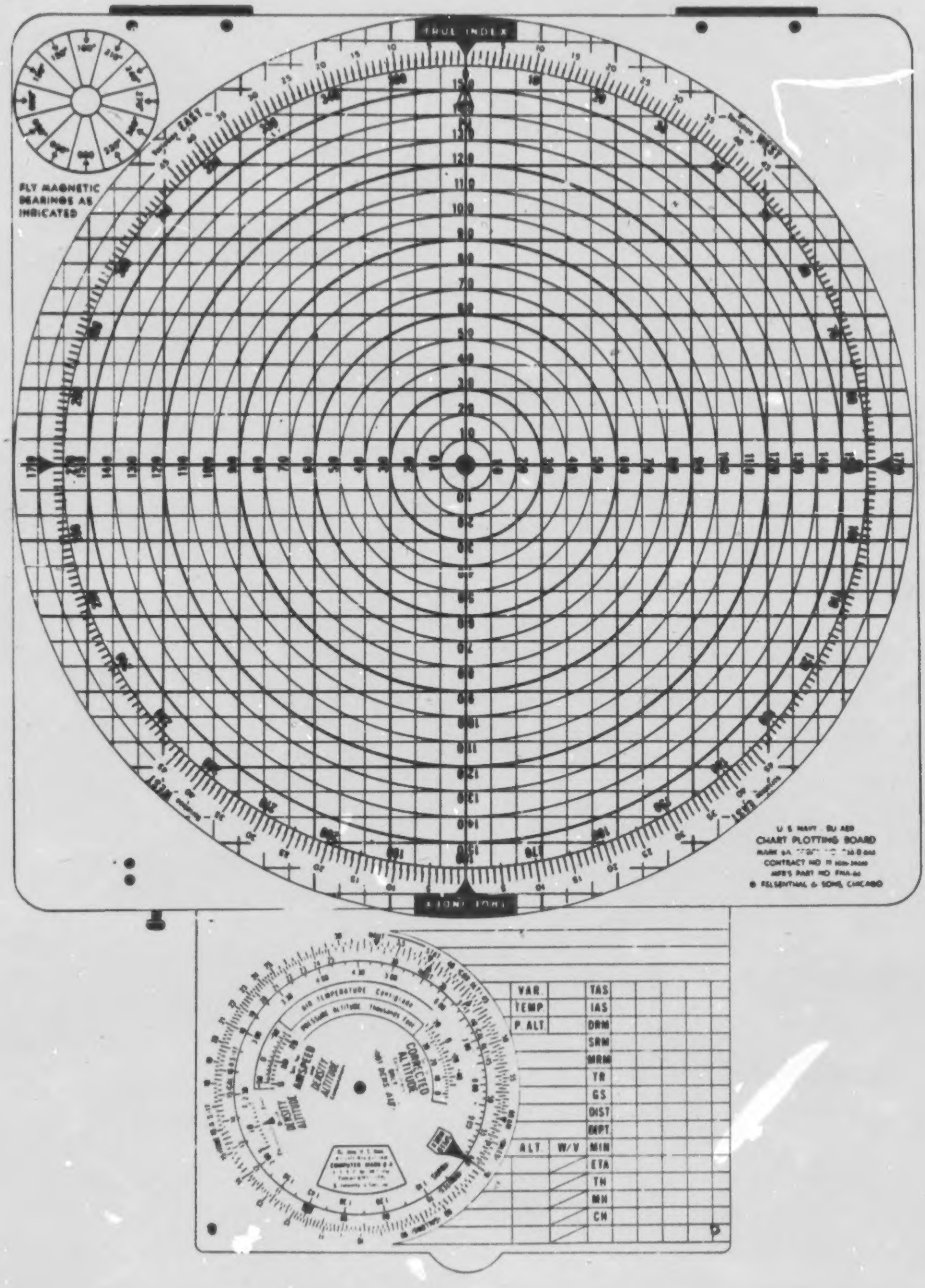
From	*To*	*Use Scale*
0 yards	10,000 yards	1:1
10,000 yards	20,000 yards	2:1
20,000 yards	30,000 yards	3:1
30,000 yards	40,000 yards	4:1
40,000 yards	50,000 yards	5:1

At times it may be convenient to choose one scale for the relative plot and another scale for the vector diagram. (One scale represents distance; the other, speed.) The same table can be used, except that where the table reads yards,



36.65(85)B

Figure 7-8.—Maneuvering board.



114.42

Figure 7-9.—Mechanical maneuvering board.

substitute knots and delete the last three zeroes; for example, 10 knots to 20 knots, 2:1 scale.

At the bottom of the maneuvering board is a nomogram. The nomogram affords a ready means of interconverting time, speed, and distance, and solving graphically for any one of these quantities when the other two are known.

Figure 7-8 illustrates time-speed-distance scales. The top line is the time line or logarithmic scale in minutes; the middle one is the distance scale. Numbers on top of the distance scale give distance in yards; those below, distance in miles. The bottom line is the speed scale in knots.

The words "relative" or "actual," used with speed and distance scales, are included only to inform the plotter that both relative and actual problems may be solved. When relative distance is used, the corresponding speed must be relative.

Time-speed-distance scales are based on the formula: Distance = speed x time. These scales are so arranged that by marking off any two known values in this formula, and laying a straightedge through the points so marked, the correct value of the third quantity is the point of intersection on the third scale.

Suppose it is observed that ship travels 1000 yards in 3 minutes. What is the speed? The graphic solution to the problem is seen in figure 7-8. On the time scale, 3 minutes is located, and 1000 yards is located on the distance scale. A straight line then is drawn through these two points and is extended across the speed scale. The speed scale is cut at 10 knots, answering the problem. If the distance in fig. 7-8 is relative, then relative speed must be used to obtain a correct answer.

MANEUVERING BOARD TECHNIQUE

The following hints on maneuvering board problems are based on mistakes commonly made by students. It is a good idea to refer to these suggestions periodically. Practically all mistakes result from violation of one or more of these maneuvering board techniques or from poor arithmetic.

1. Read the problem carefully, and be certain it is understood before undertaking the solution. Check all numbers very carefully.
2. Reciprocals should be used only when necessary. When a bearing is given, make sure of the ship to which the bearing applies and from which it is taken.
3. Be particularly careful of the scale used on the nomogram.
4. Make all measurements accurately, and read the plotted answers carefully. It is easy to use the wrong circle or make an error of 10° in direction.
5. Plot only true bearings. If a relative bearing or compass direction is given, convert it to a true direction before plotting.
6. Label all points, and put arrowheads on lines as soon as they are drawn.
7. Remember that relative direction is from *r* to *m*. (Use as a memory aid: Roger chases Mary.) The arrowhead never points in the opposite direction.
8. True speed vectors always originate at the center of the diagram.
9. Vectors point to the direction of true motion, and vector length indicates true speed.
10. Motion along the relative movement line is associated with relative speed— not true speed. Relative speed is determined when relative distance and time are known. To obtain true speed, true distance and time must be known.
11. Don't forget that the maneuvering ship moves with respect to the reference ship. Consequently, the reference ship is always at the center of the diagram.
12. Do not attach undue significance to the center of the maneuvering board. This point is used merely for the sake of convenience both as the origin of actual speed vectors and as the position of the reference ship.
13. Work a problem one step at a time. An entire problem may seem complicated, but each step is simple, and often suggests the next step. Bear in mind that all problems are based on a few simple principles.
14. The same scale must be used for all speeds. All distances must be drawn to a common scale.
15. In actual problems, at least three plots are needed on a contact for accurate solutions.

MANEUVERING BOARD PROBLEMS

Maneuvering board methods are adaptable to a great variety of operations. Maneuvering board problems presented here for solution are encountered most frequently during fleet, task force, squadron, or convoy movements, and in circumstances pertaining to ships in any other formations. Methods employed are also of importance in connection with air and submarine operations.

Some problems encountered in movement of ships in formation are fairly simple to solve. If simple problems are thoroughly understood, the more involved ones become easy, because they are composed of several elementary parts.

In addition to basic problems that follow, plotters should know how to set up a maneuvering board to indicate a tactical organization and disposition of own force. This information can be obtained from ATP 1, Volume I.

Dutton's *Navigation and Piloting* and the *Maneuvering Board Manual* (H.O. Pub. 217) serve as excellent references for information on uses of the maneuvering board not covered in this chapter.

CLOSEST POINT OF APPROACH

Suppose that at 0530 CIC reports a contact bearing 236° at 18,000 yards. Ten minutes later the contact bears 229° at 14,000 yards. The plotter will want to figure the following data:

1. Direction of relative movement (DRM) of contact with respect to own ship.
2. True bearing of contact when it reaches minimum range.
3. Minimum range to contact (range to CPA).
4. Relative bearing of contact when it reaches CPA.
5. Speed of relative movement (SRM) of contact with respect to own ship.
6. Time at which contact will reach CPA.

First, plot the M_1 and M_2 positions of the contact. Mark on the bearing circle the first bearing (236°) and lay parallel rulers on that mark and the center of the board. For the range, select the largest scale practicable. Because of the range (18,000 yards) a 2:1 scale seems most logical. Place a dot where the bearing line crosses the 9 ring (fig. 7-10). This dot is the M_1 position. Plot the M_2 position in the same manner. Draw a line between the M_1 and M_2 positions, and extend the line past the center of the board as shown. To find direction of relative movement (DRM), lay parallel rulers along the relative movement line (M_1 to M_2), walk them to the center of the board, and draw a short line through the bearing circle. The DRM (or relative course) is 079.

The CPA of the contact is the shortest distance between the extended relative movement line and the center of the board, and must be a line perpendicular to the relative movement line. Direction of this line from the center is also the true bearing of CPA.

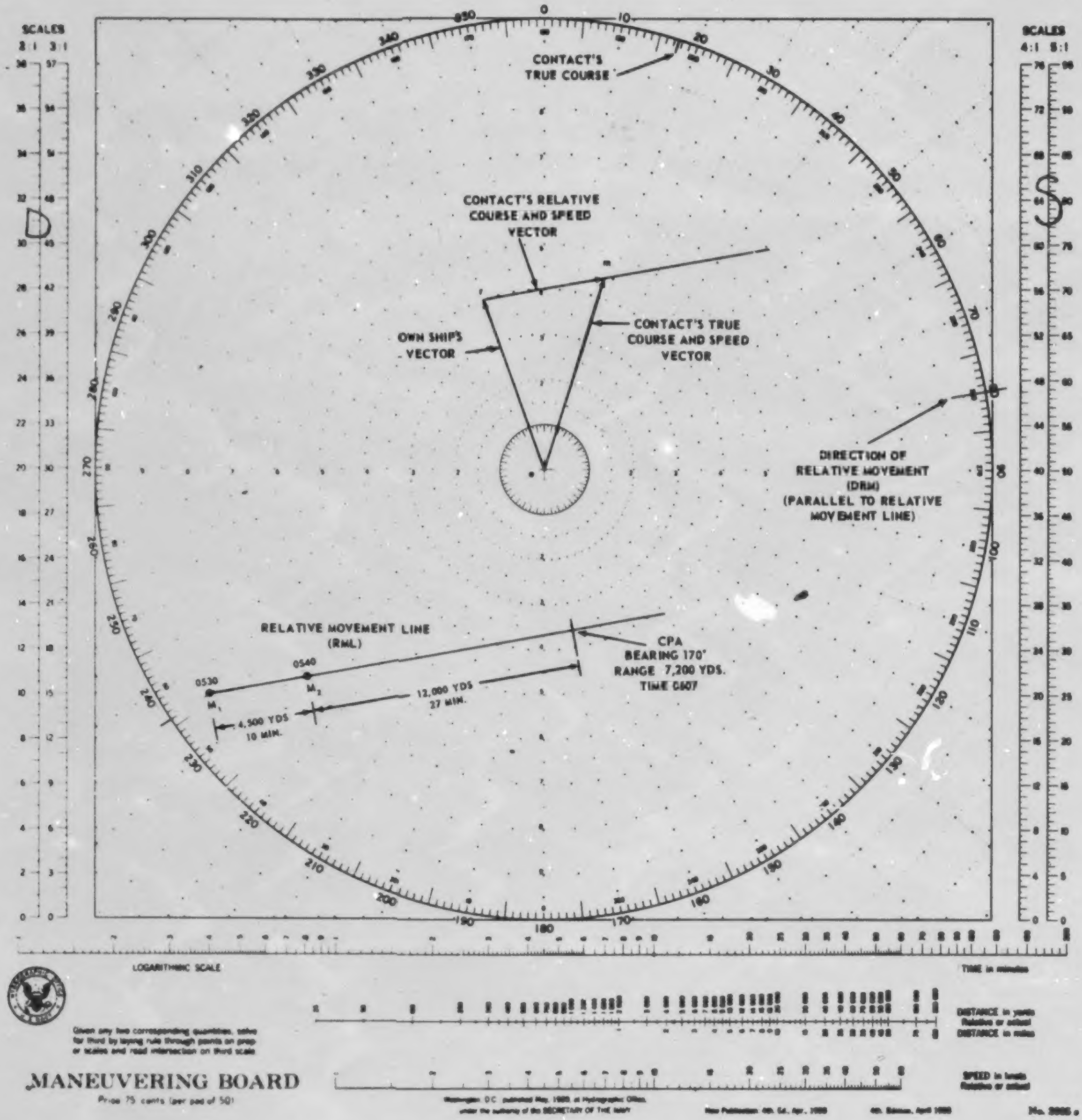
Two methods are used to find the bearing of CPA. The first method is to add 90° to or subtract 90° from DRM. The plotter should be able to tell by inspection whether to add or subtract. In this example, he must add. Hence, at CPA, contact will bear 169° (079° + 90° = 169°).

A second way to find the bearing of contact at CPA is to use a right angle triangle. Lay one side of the right angle along the direction of relative motion line (DRM) move the triangle along the DRM until the other side passes through the center of the board. Draw a line across the DRM line. Lay the parallel rulers along this line and the center of the board. Read the bearing on the bearing circle.

To find the range of CPA, use dividers to measure the distance on the proper ratio scale at the side of the board. In our example, the range is 6900 yards.

At times it helps to know what the relative bearing of CPA will be. To find relative bearing, subtract own ship's heading from the true bearing. Suppose that own ship's course is 340°. Obviously, one cannot subtract 340 from 170, but if 360° is added to true bearing, the subtraction can be accomplished with no trouble. Thus, 170° + 360° = 530° and 530° - 340° = 190° = relative bearing of CPA.

We now know four of the CPA items, but we still must know speed of relative movement (SRM) and time of CPA. To find SRM, measure the distance between M_1 and M_2 on the proper scale. This measurement is the distance traveled


SCALES
CONTACT'S TRUE COURSE
CONTACT'S RELATIVE COURSE AND SPEED VECTOR
r
m
OWN SHIPS VECTOR
CONTACT'S TRUE COURSE AND SPEED VECTOR
DIRECTION OF RELATIVE MOVEMENT (DRM) (PARALLEL TO RELATIVE MOVEMENT LINE)
RELATIVE MOVEMENT LINE (RML)
0530
M_1
0540
M_2
4,500 YDS 10 MIN.
12,000 YDS 27 MIN.
CPA BEARING 170° RANGE 7,200 YDS. TIME 0607
D
S
LOGARITHMIC SCALE
TIME in minutes
DISTANCE in yards
DISTANCE in miles
SPEED in knots
MANEUVERING BOARD

36.65(85)C

Figure 7-10.–Solving for CPA and true course and speed.

in 10 minutes. Mark those quantities on the nomogram at the bottom of the maneuvering board and find speed (explained earlier). Relative speed is 13.5 knots.

To find time of CPA, measure the distance from M_2 to CPA. With this quantity and relative speed, again go to the nomogram. Required information is the time required for the contact to get to CPA. Add this time (27 minutes) to the time at which the contact was at M_2. Time of CPA is 0607.

TRUE COURSE AND SPEED

In order to work some problems on the maneuvering board, it is necessary to know true course and speed of the maneuvering ship. For an unknown contact, about the only means of finding course and speed is to determine relative direction and speed, and use this base as one of the known sides in a vector diagram (speed triangle).

Consider the contact in the CPA problem just solved (fig. 7-10). It was found that relative direction was 080° and relative speed 13.5 knots. Own ship's course was 340°. Assume that our speed is 20 knots. With this speed a 3:1 scale is logical, so draw own ship's vector from the center of the board. Don't forget the arrow on the end of the vector. Own ship's vector is labeled *er* as shown.

Remember that DRM was 079°, so lay the parallel rulers on the center and the 079 of the outer circle. Walk the rulers to the end of own ship's vector, and draw a line in the direction of relative movement. With dividers, select the contact's relative speed (13.5 knots) from the 3:1 ratio scale. Apply this speed to the line that was just drawn, measuring from the end of own ship's vector (*r*). Complete the vector with an arrow pointing in the direction of relative movement. Label this vector *rm*.

Draw the third side of the triangle, and without moving the rulers, draw a short line across the bearing circle. This line is contact's true course, 017°. The length of the vector is true speed (22.4 knots). Label *em* has already been applied.

Notice how logical the labels are: *r* for reference ship, *m* for maneuvering ship, and *rm* for relative movement. Not only do these labels keep the plotter from becoming confused, but they also enable other personnel to understand his plot.

Another aid, here, is to note the scales used. The 2:1 scale, for example, was used for distance in the relative movement plot; the 5:1 scale, for speed in the vector diagram. Thus, a D was marked on the 2:1 scale and S on the 5:1 scale. If the 1:1 scale is used, no marks are needed.

NEW CPA

The problems just solved show that there is nothing to worry about from the other ship so long as both ships continue on their present courses and speeds, but what happens if one ship changes course or speed?

Naturally, if the contact makes a change, the plotter must work out an entirely new problem.

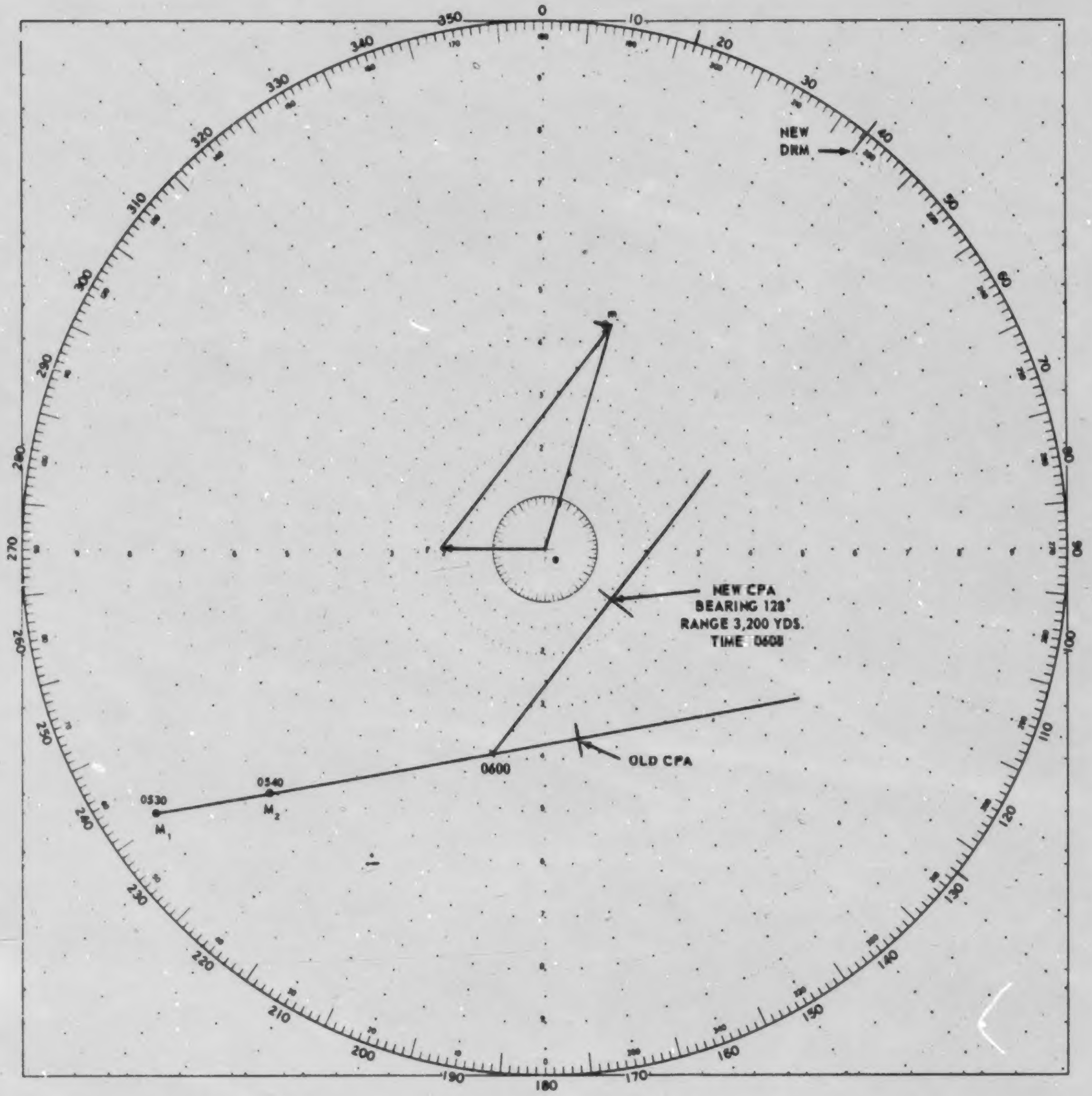
If own ship is going to change course and/or speed, however, it makes sense to determine a new CPA before the change. This procedure may prevent putting own ship into possible danger. A new CPA can be found by using a vector diagram to solve for a new relative movement and relating the new *rm* to the old problem.

Suppose that own ship is a DD, scheduled to rendezvous with a CVA, and that the night order book contains an order to change course to 270° and speed to 10 knots at 0600.

In actual practice this problem would be worked out on the same board as the old one, but to avoid confusion, a new board is used on our example. (See fig. 7-11.) Needed information: the old relative movement line and contact's true course and speed vector *em*.

First, determine contact's 0600 position on the old relative movement line. (Remember that relative movement was computed on the 2:1 scale.) Contact was at M_2 at 0540. Therefore, go to the nomogram with relative speed (13.5 knots) and time (20 minutes). Mark this distance (8900 yards) from M_2 and label the position 0600.

Draw in the new own ship's vector 270° at 10 knots. (This vector was on the 5:1 scale.) Label own ship's vector *er*. Complete the triangle for the new relative movement *rm*. Walk the rulers to the center of the circle and draw a line across



36.65(85)D

Figure 7-11.—Solving for a new CPA.

the bearing circle to find the new DRM, 037°. Walk the rulers down to the 0600 position and draw a line past the center of the circle in the new direction of relative movement. The new DRM plus 90° equals true bearing of the new CPA, 027°.

Measure the distance between the 0600 position and the new CPA. Using the new relative speed (27 kts) and this new distance (7,500 yds.), find the time required to traverse that distance (08.5 minutes). New time of CPA is 0608:5, at distance 2800 yards.

CHANGE OF STATION

A common use of the maneuvering board is to determine course and speed to proceed to a new station. To illustrate this use, a few change of station problems follow.

Problem 1

Problem 1 (fig. 7-12) is designed to show a maneuvering board solution in determining the required course and speed for a maneuver.

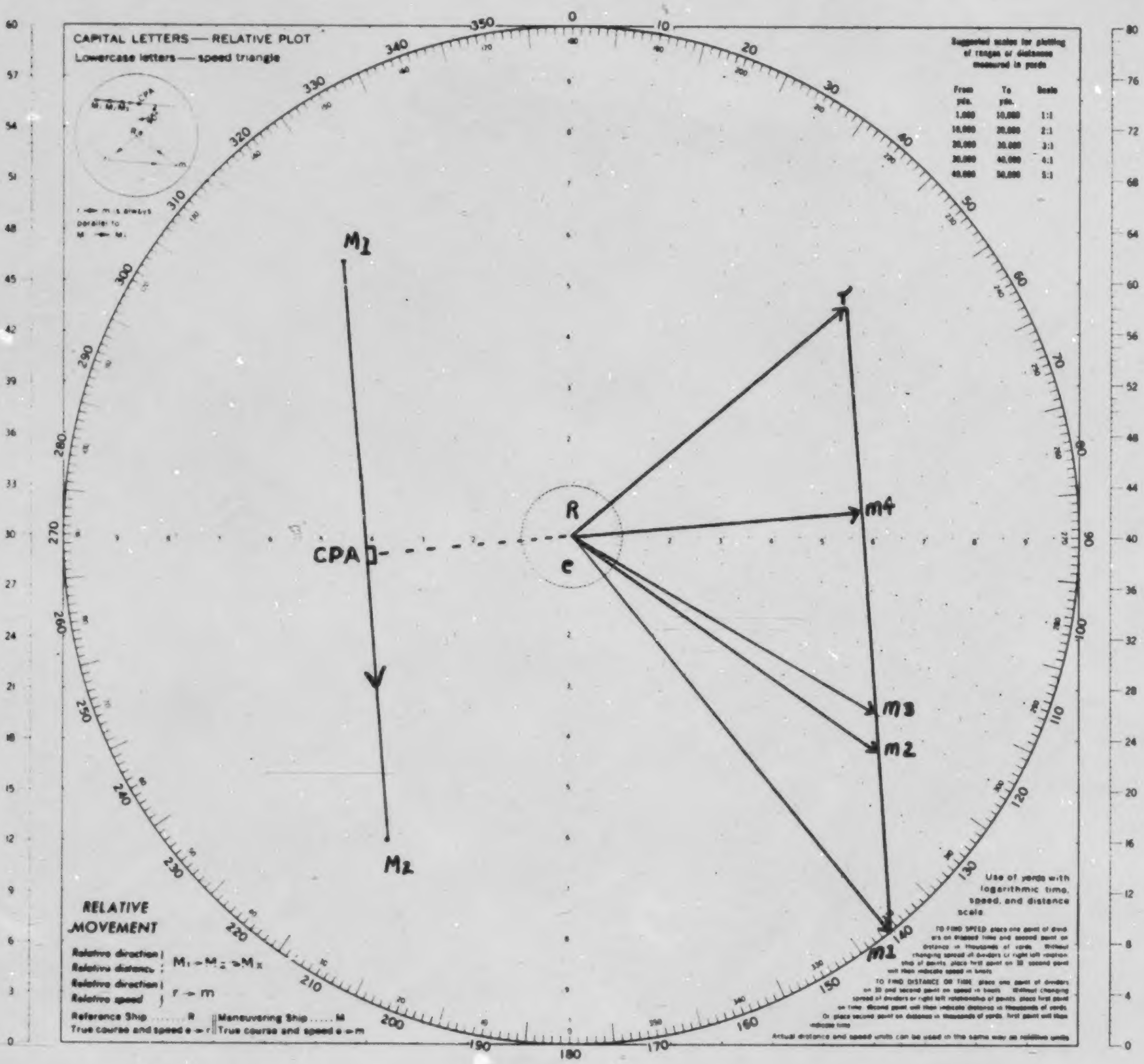
Situation: The guide is on course 050°T, speed 14 knots. The guide bears 140°T, range 7000 yards. Take station bearing 211°T, range 7000 yards from the guide.

Required:

a. DRM
b. MRM (Relative Distance)
c. CPA.
d. Own ship's course to station at 20 knots.
e. Own ship's course to station at 15 knots.
f. Own ship's speed if course 120°T is steered.
g. Minimum speed to complete maneuver.
h. Own ship's course at minimum speed.

Solution (recommend scale of 2:1 in knots and 1:1 in thousands of yards):

1. Draw the *er* vector to represent true course (050°T) and true speed (14 knots) of the guide (reference ship). Plot M_1. Because the guide (reference ship) is in the center, point M_1 must be plotted in the direction 320°T from the center, on the 7 circle. Hence, the bearing to the guide from own ship will be 140°T. Plot M_2. With the guide in the center, M_2 is then on the 7 circle in the direction 211°T from the center. Connect M_1 and M_2 and place an arrowhead on the relative movement line (M_1M_2 line) to indicate that the direction of relative motion is from M_1 to M_2. The DRM can now be determined by placing the parallel rulers on the relative movement line (M_1M_2 line) and moving them to the center of the maneuvering board. The MRM can also be determined by measuring the distance between M_1 and M_2.
2. Locate the CPA by drawing a perpendicular from the M_1M_2 line to R (shown by the dotted line in fig. 7-12). The direction of the perpendicular from CPA toward R is the bearing of the CPA from own ship to the guide. In this example, it is found by subtracting 90° from the DRM. The range to the guide at CPA is found by measuring (to scale) the distance from CPA to R.
3. Using parallel rulers, draw the *rm* vector parallel to the M^1M_2 line and in the same direction as the DRM. Begin this line at point *r* and continue it indefinitely. Using dividers, measure 20 knots on the 2:1 scale. Place one point of the dividers on point *e* and swing the other end of the dividers until it intersects the *rm* (relative speed) vector, labeling the point of intersection m_1. Complete the triangle by drawing the vector em_1 from the center of the diagram (*e*) to m_1. The direction of this line represents own ship's course to station, using speed of 20 knots.
4. Locate the point m_2 on the *rm* line where it intersects the 15-knot circle (17.5 circle, using the 2:1 scale). Connect points *e* and m_2. The direction of em_2 represents the course to station, using a speed of 15 knots.
5. Draw the vector em_3 in the direction 120°T from the center (*e*) to its point of intersection with the *rm* vector. The length of this line (from *e* to m_3), measured on the appropriate scale, represents the true speed to station, steering course 120°T.
6. Minimum speed is the slowest possible speed at which own ship can complete the maneuver. This slowest speed is represented by the shortest value of the *em* vector that can be drawn. The location of *m* for this condition is on the relative speed vector (*rm* line) at its nearest point to *e*, or at the foot of a perpendicular from *e* to the relative speed (*rm*) vector. Connect points *e* and m_4. The length of em_4 represents the minimum speed to complete the maneuver.
7. Proceed as in step 6. The direction of em_4 represents the course to station at minimum speed.



36.65(37)A

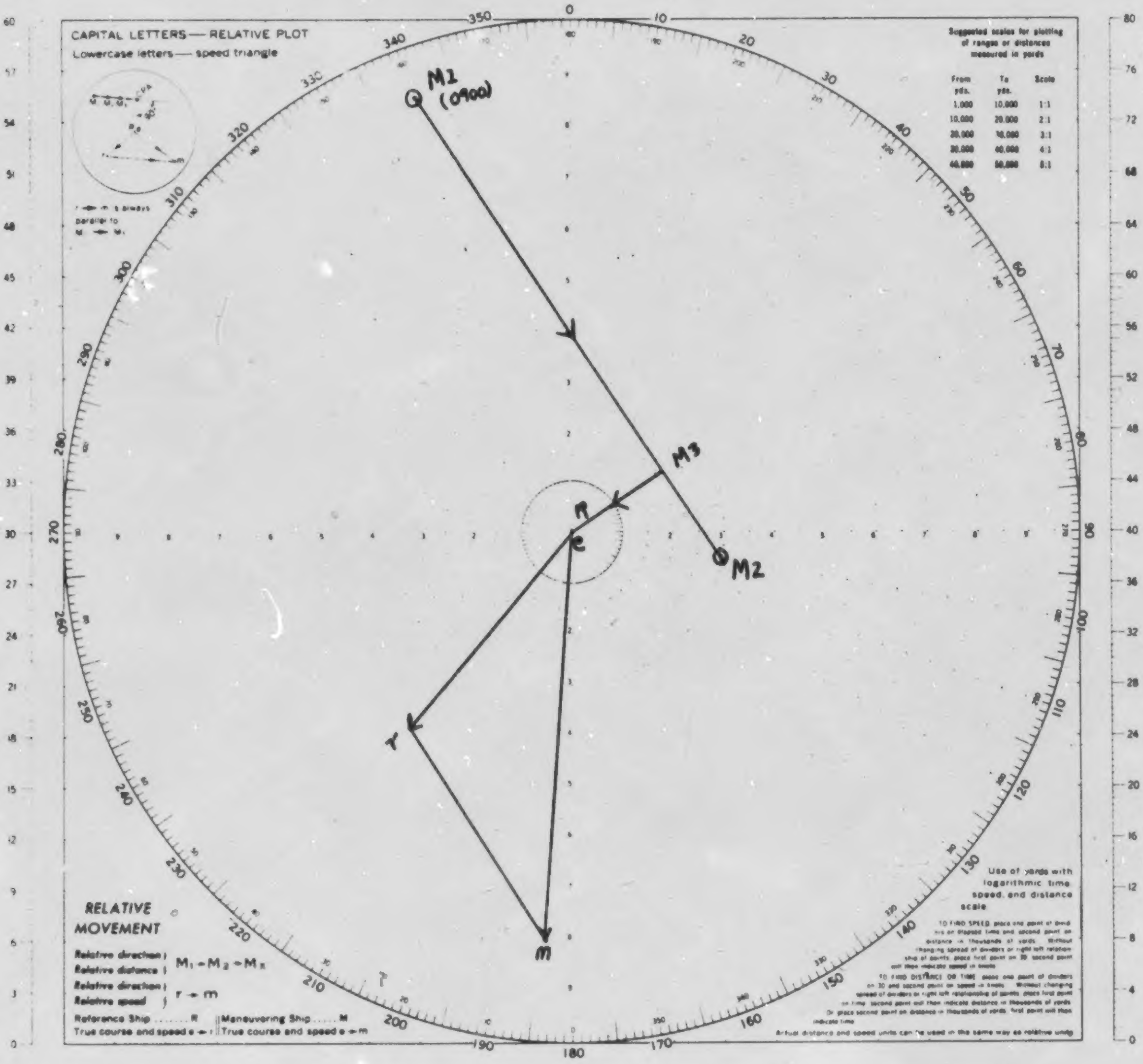
Figure 7-12.—Problem 1.

Answers:

- a. DRM—175.5°T.
- b. MRM—11,400 yards. (Relative Distance)
- c. CPA—085.5°T at range 4050 yards.
- d. Course to station at 20 knots 140.6°T.
- e. Course to station at 15 knots 125°T.
- f. Own ship's speed if course 120°T is steered 14 knots.
- g. Minimum speed 11.5 knots.
- h. Own ship's course at minimum speed 085.5°T.

Problem 2

Problem 2 (fig. 7-13) is designed to show a maneuvering board solution in determining the


CAPITAL LETTERS — RELATIVE PLOT
Lowercase letters — speed triangle
M1
(0900)
M3
M2
R
e
r
m
RELATIVE MOVEMENT
Relative direction
Relative distance
M1 → M2 → Mx
Relative direction
Relative speed
r → m
Reference Ship .... R
Maneuvering Ship .... M
True course and speed e → r
True course and speed e → m
Use of yards with logarithmic time speed, and distance scale

36.65(37)B

Figure 7-13.—Problem 2.

course and speed to complete a maneuver in a specified time.

Situation: The guide is on course 225°T, speed 15 knots. At 0900 the guide bears 160°T, range 9000 yards.

Order received: Take station bearing 100°T from the guide at a distance of 3000 yards. The commanding officer desires own ship to be on station in 20 minutes.

Required:

a. Course to station.
b. Speed to station.
c. CPA.
d. Clock time of CPA

Solution (recommend scale of 3:1 in knots and 1:1 in thousands of yards):

1. Draw the *er* vector to represent the true course (225°T) and the true speed (15 knots) of the guide (reference ship). Plot M_1 and M_2. Connect M_1 and M_2 by a line and place an arrowhead on this line to indicate that the direction of relative motion (DRM) is from M_1 to M_2. Measure distance between M_1 and M_2 to find relative distance (MRM). Using this distance (MRM) and the allotted time to get to station (20 minutes), enter the nomogram to find relative speed (SRM). Draw the *rm* vector parallel to the relative movement line M_1 M_2 line) and in the same direction as the (DRM). Begin this line at point *r* and extend it indefinitely. Measure the relative speed (already found) on the dividers and lay off this value on the relative speed vector, thus locating point *m*. Connect points *e* and *m*. The direction of the *em* vector (from *e* to *m*) represents course to station.
2. To find the speed to station, measure to scale the length of the *em* vector found in step 1.
3. Locate the point M_3 on the M_1M_2 line by constructing a perpendicular from the relative movement line (M_1M_2 line) to the center, R (shown by dotted line in fig. 7-13). The direction of the perpendicular from M_3 to R is the bearing of CPA from own ship to guide. In this example, it is found by adding 90° to the DRM. The range to the guide at CPA is found by measuring to scale the distance from M_3 to R.
4. To find the clock time of CPA, measure the distance between M_1 and M_3. Take this distance and the relative speed (SRM) found in step 1, and enter the nomogram with these values to solve for the time, in minutes, to CPA. Add this time to 0900 (the M_1 position) to find clock time of CPA.

Answers:

a. Course to station 184°T.
b. Speed to station 24 knots.
c. CPA 236°T, 2150 yards.
d. Clock time of CPA 0916.3.

Problem 3

True wind is the speed of wind and the true direction from which it blows, as measured at a fixed point on the earth. Apparent wind is the speed and true direction from which wind blows as measured at a point that is moving relative to the earth's surface. (See fig. 8-14.)

Scale 2:1 in knots.

Situation: A carrier on course 030°, speed 15 knots, measures apparent wind as 20 knots from 062°.

Required: Direction and velocity of true wind.

Solution:

1. Draw vector *er* for carrier's course and speed.
2. From *r* draw apparent wind vector, 20 knots, in the direction 242° (062° + 180°) or with apparent wind. Label vector *rw*.
3. Connect *e* and *w*. Vector *ew* represents true wind. Note that the direction from which it blows is given as the answer.

Answer: True wind 10.8 knots from 109.5°.

Problem 4

Scale 2:1 in knots. (See fig. 7-15.)

Situation: A ship is on course 075°, speed 18 knots. True wind is 7 knots from 170°.

Required: Speed direction of apparent wind.

Solution:

1. Draw vector *er* for ship's course (075°) and speed (18 knots).
2. Draw vector *ew* with true wind toward 350° at 7 knots.
3. Connect *rw*, apparent wind.

Answer: Apparent wind 18.7 knots from 097°.

SHIP HANDLING

A Signalman First or Chief may be assigned as PO in charge of a yard tug, fuel oil or gasoline barge, YF, or some other single-screw yard craft

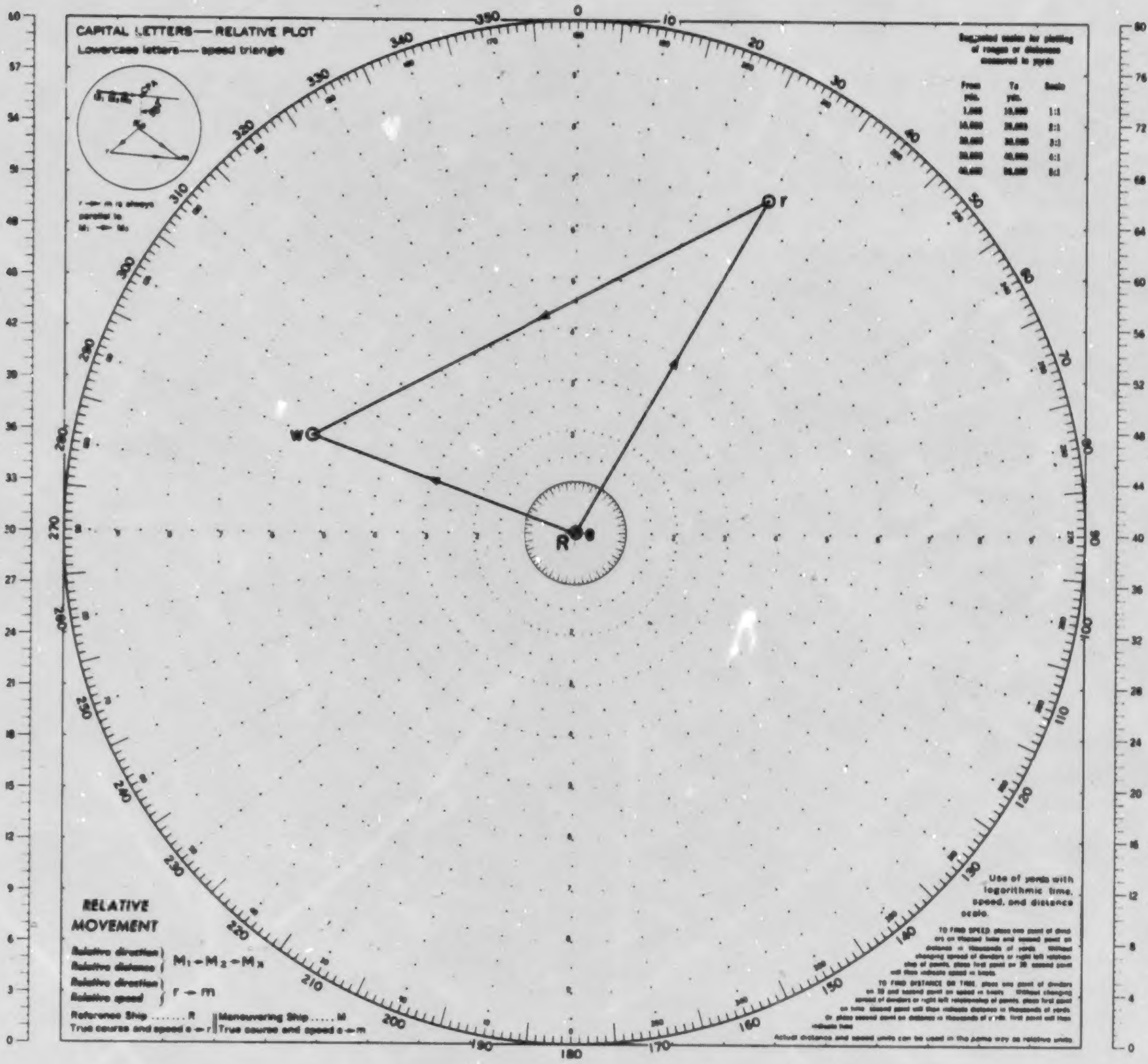


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Figure 7-14.—Problem 3.

of considerable size. Aboard some vessels he may also be assigned watches as OOD or JOOD. Such duty requires a working knowledge of ship handling.

Ship handling, like most other phases of seamanship, can be learned thoroughly only through experience. A man taking over a sizable yard craft or standing OOD/JOOD watches for the first time, however, will be considerably ahead of the game if he knows what a vessel is likely to do under various circumstances. Single-screw ships are the most difficult to handle. It is for this reason that the following discussion applies to single-screw ships only. A man whose ship has twin screws is that much better off. Many idiosyncrasies of single-screw ships will not be present with twin screws. By going ahead on one engine and backing the other, he is able

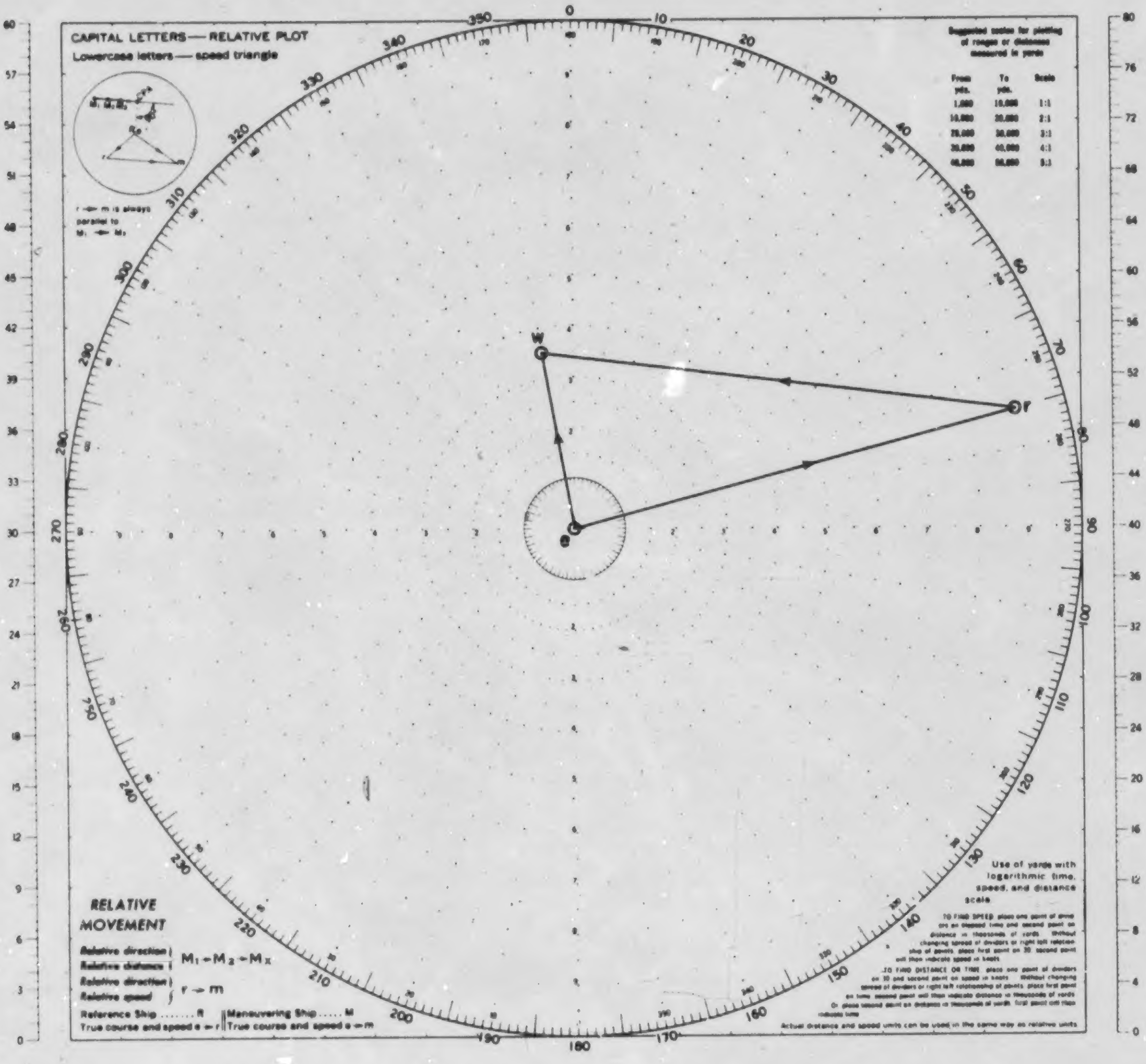

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Figure 7-15.—Problem 4.

to maneuver in a small space and to much better advantage. It would be wise also to study sections devoted to ship handling in Knight's *Modern Seamanship*, in addition to material in this chapter.

PHYSICAL CHARACTERISTICS OF SHIPS

A new skipper should be enthusiastic about his billet. He should be interested in learning everything he can about his ship; in fact, he should know more about the ship than any man on board. Many details in which a new skipper is interested–such as material condition, personnel, logs, and records–are not too closely allied with ship handling. A wealth of material is available, however, in a ship's characteristic cards, damage control books, and the like. Some of the more important characteristics the SM 1 or C must learn about his ship follow. They apply equally to OOD/JOOD watch standers.

1. Dimensions: Know the ship's overall length and beam. This knowledge is helpful in determining minimum dimensions of the berth she requires and in gaining an insight into her handling characteristics. If she's a tug or other type that frequently goes alongside large ships, the height of mast must be known to tell how high the ship's overhang must be for the craft to fit under it, or whether the mast will have to be unshipped.
2. Draft at various loadings: Draft is the depth of water necessary to float a vessel, and, of course determine the minimum depth of water a ship may safely navigate, and the load stability condition at all times.
3. Freight and passenger capacity: For freight, this information is necessary to ensure that the vessel is not overloaded, that she is full and down but with no list, sagging, or hogging, and that she has the desired trim and stability. Passenger capacity for ship type is decided by higher authority, based on adequacy of messing and berthing facilities.
4. Main engines–a. Capability includes maximum speed, best cruising speed, economical cruising speed, maximum backing power, and maximum propeller line pull. The time required and power necessary for stopping the vessel from any given speed must also be known. Acceleration and deceleration time rates, in tabular form, should be available for use on the bridge.
   - b. Engine controls: Signalmen should have accurate knowledge of the location and operation of all types of engine controls and all means of communication between engineroom personnel and himself, as conning officer.
   - c. Fuel capacity: Know the capacities of various fuel tanks–crude, diesel, gasoline, or any combination that may be installed. This information is vital in computing cruising radius and in damage control or preparing for heavy weather when it may be necessary to ballast or shift fuel.
5. Rudder: Signalmen must know the space required for a turn at various speeds, which involves knowing the turning effect of the rudder at various angles.

Much can be learned about the aforementioned ship characteristics by questioning the skipper being relieved or the senior watch officer. From them can also be learned any characteristic of the ship that may be a departure from the norm–such as a tendency to sheer in the wind, cranky steering at certain speeds, or sluggish answering of the rudder.

MANEUVERING CHARACTERISTICS

Before delving into mechanics of ship handling, it is necessary to understand the forces that act on a ship under various speed and rudder angle conditions. If aware of these maneuvering characteristics, a ship handler can compensate for undesired effects and utilize helpful effects advantageously. Without knowledge of these forces, ship handling at best would be a trial-and-error procedure.

FORCE FACTORS

It is beyond the scope of this training course to discuss hydrodynamic principles. Experts are not in complete agreement among themselves why forces created by a ship's propeller and rudder react as they do on the ship. They do agree, however, that forces so generated result from pressure differences. To understand how these pressure differences occur, consider the following definitions.

- Dynamic pressure: For all practicable purposes, water is incompressible. If force is applied to water, thereby causing high pressure, water flows to a lower pressure area, producing a force known as dynamic pressure.

- Propeller thrust: High- and low-pressure areas are created by a ship's propeller. As a propeller revolves, the shape and pitch of each blade cause a thrust, derived from low-pressure and high-pressure areas on either face of the blades. The resultant dynamic pressure is transmitted along the propeller shaft to thrust the ship ahead or astern. This force is known as propeller thrust.
- Rudder force: The rudder exerts its force in somewhat similar fashion to propeller thrust. When the rudder is set at an angle on a moving ship, a high-pressure area is built up on the leading surface, and a low-pressure area forms on the trailing surface. Through this difference in pressure areas, the water exerts a force nearly perpendicular to the leading surface of the rudder. In turn, the rudder forces the stern in the direction opposite that to which the rudder is set. This force is known as rudder force.

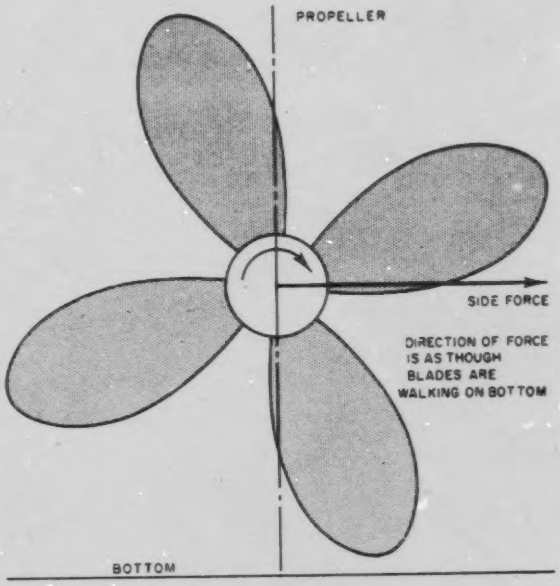
Side Force and Screw Current

Before discussing screw and rudder combinations and how they affect a ship, some additional force factors must be understood.

- Side force: In maneuvering a single-screw ship, side force ranks next in importance to propeller thrust. Side force is defined as a force that moves (walks) the stern of a ship to one side or the other. The causes of side force are somewhat involved.

All that a conning officer needs to know is that, as a result of the rotating propeller, a force is created moving the stern of the ship in the direction of propeller rotation. The effect is as though the lower blades of the propeller were touching the bottom and pushing the stern to the side. (See fig. 7-16.) Side force is at its maximum when the ship is dead in the water. It decreases rapidly with an increase in ship speed. Likewise, side force is greater when the ship is backing than when moving ahead. (See screw current.)

- Screw current: Screw current, caused by action of a rotating propeller, consists of two parts. The portion flowing into the propeller is the suction current; that flowing away from the propeller is the discharge current. Suction current is a relatively minor force in ship handling. Discharge current is a major force in ship handling in two main respects. First, it produces a large force on the rudder with the screw going ahead. Second, it is a strong component of side force when the screw is backing, because of the part of the discharge current that acts against the ship's counter.


PROPELLER
SIDE FORCE
DIRECTION OF FORCE IS AS THOUGH BLADES ARE WALKING ON BOTTOM
BOTTOM

112.49

Figure 7-16.—Side force.

TURNING CIRCLE

A ship's turning circle is the path described by the ship in completing a full 360° turn with a constant rudder angle. Such a turn is illustrated in figure 7-17. The diameter of the turning circle decreases with any increase in rudder angle. High speed also has noticeable effect on turning circle, the amount of change depending upon the ratio of speed to the square root of the length of the ship. The greater the ratio, the greater is the diameter of the turning circle. Small changes in speed, however, do not significantly alter the diameter. The following definitions relate to various aspects of the turning circle.

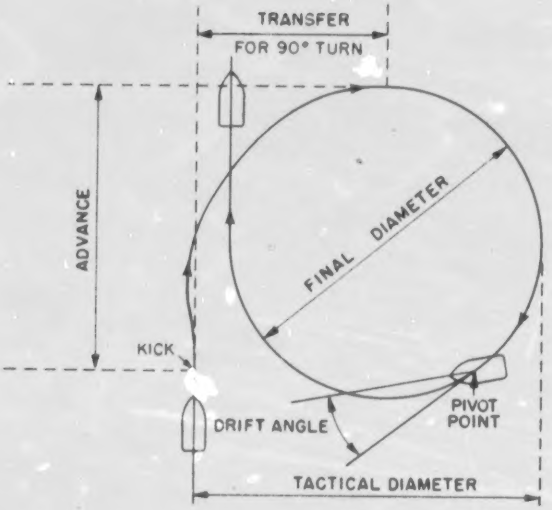


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Figure 7-17.—Turning circle.

- Advance: Distance gained toward the direction of the original course after the rudder is put over.
- Transfer: Distance gained at right angles to the original course when turning. Figure 7-17 shows transfer for a 90° turn. For a 180° turn, transfer equals tactical diameter.
- Tactical diameter: Perpendicular distance between the path of a ship on her original course and the path of a ship when a 180° turn is completed with a constant rudder angle. Standard tactical diameter is prescribed in current tactical orders. To obtain tactical diameter, the conning officer should know the rudder angle.
- Standard rudder: Rudder angle necessary to turn ship in prescribed tactical diameter.
- Final diameter: Diameter of a circle ultimately scribed by a ship that continues to circle with a constant rudder angle.
- Drift angle: Angle at any point on a turning circle between intersection of the tangent at that point and a ship's keel line.
- Kick: Swirl of water toward the inside of a turn when rudder is put over, caused by momentary movement of ship's stern away from direction of turn.
- Pivot point: The point on the centerline about which a ship pivots when rudder is put over. It is the point in a ship about which she turns and which scribes the turning circle.

Making a Turning Circle

When the rudder is put over in making a turn, the stern is momentarily forced toward the direction of the turn, then it starts to swing away as the ship begins to turn. For several lengths the ship turns very slowly from her original course, because of momentum. She then commences to gain ground in the new direction, moving sidewise (transfer) through the water to a considerable degree. This movement naturally results in loss of speed. Because of speed loss when a column turn is made, a vessel gains rapidly on the ship ahead while that ship is turning, but loses this distance during her own turn when the first ship completes her turn and steadies on her new course.

A ship's pivot point is nearly always about one-third the ship's length abaft her bow when moving ahead, and at or near her stern when moving astern. Location of a pivot point varies slightly with trim and ship's speed, but does not vary enough in the ordinary ship to cause any difficulty in ship handling. Before starting a turn, the conning officer must always bear in mind the position of his pivot point. This position is especially important in close quarters, and under these conditions the stern should be observed closely to prevent an undesirable swing.

RUDDER EFFECT

Basically, a ship's rudder is used to attain or maintain a desired heading. Force necessary to accomplish this heading is created by dynamic pressure against the flat surface of the rudder. Magnitude of this force, as well as the direction and degree to which it is applied, produces the rudder effect that controls stern movement and, through it, ship's heading. Factors that have a bearing on rudder effect include rudder size, rudder angle, headway, sternway, propeller direction, suction current, discharge current, and side force. As can be seen, the degree of each factor and the possible combinations are virtually infinite.

FUNDAMENTALS OF SHIP HANDLING

To better understand the effect of various rudder and screw combinations upon a ship, assume these ideal ship-handling conditions: no wind, no current, no tide, plenty of sea room, and no interference from other vessels. Further assume that the ship being conned is a YO with a single rudder and single right-handed screw (turns clockwise going ahead).

GOING AHEAD

In going ahead from a stopped position, the first noticeable effect is that the ship's stern swings to starboard because of side force. To counteract this swing, right rudder is applied. Necessary force is obtained from the discharge current against the rudder surface. As the ship gathers headway from propeller thrust, the ship reaches a speed where the wake current overcomes side force to a great extent, and right rudder may be removed. Now the ship will continue straight and respond well to either left or right rudder. Rudder effect is obtained from dynamic pressure action about the rudder surface from both the screw discharge current and the action of the water through which the ship is moving.

With the ship going ahead at a good speed, suppose the conning officer wants to stop. The screw is backed. Propeller thrust is in direct opposition to the forward motion of the ship, causing her to start slowing. Side force and part of the discharge current tend to force the stern to port. This direction of movement can be compensated for by left rudder as long as the ship has sufficient forward motion to retain steering effect. As forward motion is reduced further, steering effect is reduced to zero. Furthermore, side force and that part of the discharge current acting against the ship's counter cause the stern to swing to port. This trend can be compensated for partially by shifting to right rudder to take advantage of the force of the suction screw current acting against the rudder surface.

BACKING DOWN

Backing down in a straight line with a single-screw ship is virtually impossible without alternating the direction of the screw and the position of the rudder.

In going astern from a stopped position, the stern swings to port because of side force and a portion of the discharge current. This force cannot be counteracted, even with right full rudder, because the suction current acting against the rudder surface is a relatively weak force. As the ship gathers sternway, the water through which the ship is moving acts against the rudder surface, augmenting suction current force. This force slows, but probably will not stop, the stern's continued swing to port. The best way to straighten out is to go ahead on the screw and, as discharge current builds up, shift rudder to left full. Two forces now are working to stop port swing and bring the ship to her proper heading. These forces are side force and the discharge current acting against the rudder surface. When the heading of the ship is satisfactory, continue backing procedure used initially. Once sufficient sternway has been attained, heading can easily be controlled by judicious use of the rudder.

CASTING

Casting is the maneuver that often arises wherein ship's heading must be altered radically without allowing any appreciable change in ship's initial position. Casting is referred to also as turning short, twisting ship, turning her on her pivot point, and turning in her own water. All those terms mean the same thing.

Whichever rudder-screw combination is employed depends on the direction chosen to turn the ship, the shortest arc of turn being the simplest and quickest. The key to this maneuver is to apply all available forces to start the stern swinging before the ship gathers headway or sternway. If desired to pivot the ship to a heading on the port side, always go ahead on the screw with full left rudder in single right- screw ships. Side force and discharge current acting against the rudder surface force the stern to swing rapidly to starboard before propeller thrust imparts forward motion to the ship. When the ship starts to gain headway, back the screw and shift the rudder. Side force from the backing screw slows the stern's swing, but permits the ship to remain in her initial area. When forward motion stops completely, go ahead on the screw and shift rudder to left full. Repeat these screw-rudder combinations until the ship is on the desired heading.

A pivot to starboard is accomplished by a different sequence of screw-rudder combinations. The maneuver may be begun by first going ahead or astern. For purposes of simplicity, this example starts the maneuver by backing the screw with full left rudder. Side force and suction current against the rudder surface start the stern swinging rapidly to port. As the ship gathers sternway, shift rudder and go ahead on the screw. Repeat these screw-rudder combinations until the ship is on her desired heading. With a single-screw ship, it is easier and quicker to cast to starboard than to port.

GOING ALONGSIDE

From the foregoing description of handling a single-screw ship using various rudder-screw combinations, a conning officer should have a good idea what to expect of a ship under ideal conditions. Now, let's consider some of the more common ship handling situations encountered, such as going alongside.

Port-side-to: In boat handling, as already known, it is always easier to bring a single-screw craft alongside port-side-to than starboard-side-to. The reason is because, when the bow is eased in alongside the berth and backed down to kill headway, side force of the backing screw swings the stern in alongside the berth. Figure 7-18 illustrates the effect of side force when backing.

Starboard-side-to: In a starboard-side-to landing, side force swings the stern away from the berth when backing down. Consequently, approach for a starboard-side-to landing must be made at slow speed to avoid having to back hard to kill headway. Another disadvantage of a starboard-side-to landing engendered by a slow approach is that the less headway the less will be the steering effect of ship's rudder, thus making her harder to control. Most single-screw ships maneuvering starboard-side-to prepare the No. 2 line (after bow spring) on the dock side and get its eye out to the dock as soon as possible. (See fig. 7-19.) The line is belayed on the No. 2 bitts on board and carefully checked as the ship makes headway. Go ahead on the screw with full left rudder on. This combination will swing the stern toward the dock. Care must be taken to avoid parting the spring at this point. If there is too much headway, the screw must be backed to save the spring. It is also advantageous to lead the eye of the stern line well forward prior to

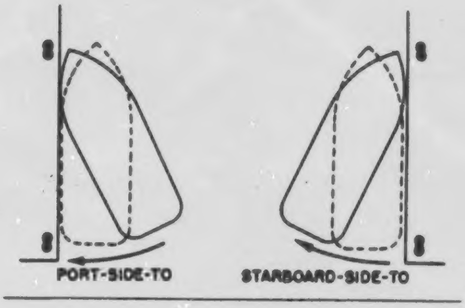

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Figure 7-18.—Effect of side force when backing.

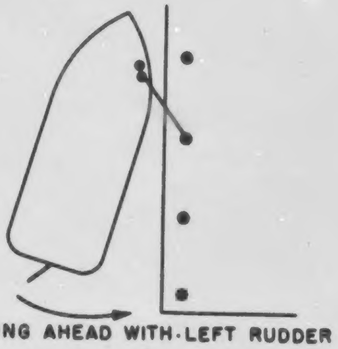

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Figure 7-19.—Use of spring line.

making the approach so that it can be sent to the pier with No. 2. This method will permit greater control of the stern. This technique is also advantageous in working into short berths. Don't forget: Backing will force the stern further off a starboard-side-to berth. Note: The going alongside discussion concerns ships or craft that would use only four lines when mooring (fig. 7-20).

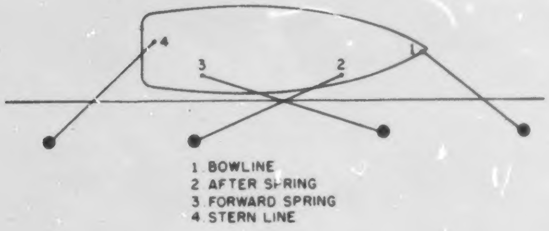

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Figure 7-20.–Mooring lines for a small ship.

WIND AND CURRENT

Often, advantage can be taken of what may appear at first to be adverse conditions of wind and current. Plan a maneuver so that all known factors are taken into account. The Navy says nothing about a time loss of a few minutes, but is highly critical of unnecessary damage to ships and installations resulting from lack of planning or poor judgment.

Current

Current from ahead: If the ship has plenty of room and a fairly strong current from ahead, ease her bow alongside, and get out the forward bow spring. Line current will bring her in to the dock, as diagramed in the first view of figure 7-21.

Current from astern: When current is from astern, putting out the after quarter spring line (second view in fig. 7-21) produces the same result as when current is from ahead. Going alongside with a current from aft is more difficult, however, because the following current makes rudder effect erratic.

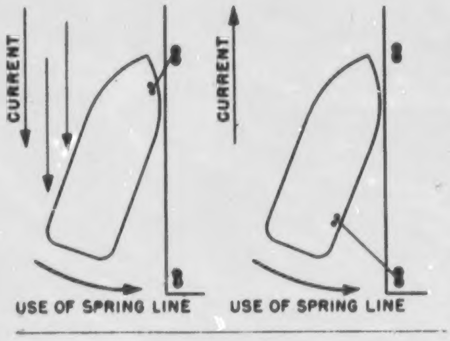

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Figure 7-21.–Making use of current.

Using current only: Going alongside by means of current alone is impractical unless there is plenty of room to range ahead or astern. Often the berth will be restricted in size, so that the bow must be eased in to go alongside, leaving no room to move ahead. This situation is no particular threat when the current is from ahead; but, in easing the stern alongside, screw and rudder must be used carefully. A following current in an approach to a small starboard-side-to berth is much more serious, not only because of the lessened steering effect of the rudder but also because side force from the backing screw combines with current to swing the stern away from the berth. A stern line is imperative in this situation. Outside assistance may possibly be needed. If possible, turn around and make the landing into the current.

Wind Effect

Wind effect is another element a conning officer must contend with when going alongside. Remember that the bow and stern may not be equal in sail area, hence wind effect on the ship as a whole will not be distributed uniformly. Realizing also that wind usually is erratic in velocity, a greater safety margin must be allowed. Another consideration is that, when approaching the lee side of a berth or another vessel, wind effect at the bow is reduced greatly while wind effect on the stern continues to act with full force. As with current, however, advantage can be taken of the wind if it is blowing toward a berth. Approach so as to stop farther out from the berth than in a no-wind situation, and let the wind bring the ship in alongside. Some use of screw and rudder may be required to keep the ship parallel to her berth.

When the wind is setting a ship off her berth, the situation is more difficult. For a port-side-to landing, approach the pier at a greater angle than normally used and with slightly more headway. Get out the bowline to hold the bow, and use side force of the backing screw to bring the stern in. To make a starboard-side-to landing, with the wind setting the ship off her berth, again approach the pier at a greater angle than normally used and with slightly more headway. Get out the bowline, No. 2 (after spring) line, and the stern line as indicated earlier.

Going ahead slow on the screw (with left full rudder), coupled with side force, rudder effect, and the lines will force the stern in against the wind. In a situation like this, experienced ship handlers may drop the port anchor to hold the bow. If it is desired to use this method, always check a chart first to ensure that dropping anchor in that area is not prohibited.

GETTING AWAY FROM A BERTH

The next operation to consider is getting underway. Take time to evaluate existing conditions, then plan a line of action. Wind effect should be apparent from the bridge. Current effect is more difficult to judge. If the ship is moored in a slip, current effect in the immediate vicinity may be completely different from that out in the stream. Throwing a block of wood over the side and noting how it is affected by the current should give an approximate idea what to expect from current action.

Starboard-Side-to Berth

When possible, the best way to clear a starboard-side-to berth is to back with left rudder. Side force and suction current on the rudder will swing the stern out from the berth so that the ship can back clear safely. If there is no room astern, the stern can be moved out from the dock by using the No. 2 line as a spring and going ahead slow with right full rudder.

Port-Side-to Berth

Unlike the method of clearing a starboard-side-to berth, trying to back away from a port-side-to landing tends to send the stern against the dock. The best procedure for getting away is to leave the No. 2 (after bow spring) line out and go ahead slowly with left hard rudder until the stern is clear. The left rudder and the lever effect of the No. 2 line will bring the stern far enough out for the ship to get away, at the same time restricting her forward motion. When the stern is well clear, take in the No. 2 line, shift rudder, and back.

Current From Ahead

With a strong current running from ahead, a ship probably could clear either starboard-side-to or port-side-to by slacking the head line and letting the current send the bow off. Once it is well off, let go all lines and go out ahead.

One must use the rudder cautiously, because putting it away from the pier will throw the stern toward the pier as the ship goes ahead, especially when leaving a starboard-side-to landing. Avoid using too much rudder until she is well clear. Use this method only when it is difficult to back out. In getting away from a starboard-side-to landing, a small amount of right rudder will keep side force from throwing the stern into the pier.

Current From Aft

With a current from aft, slacking the stern lines will carry the stern off in the same manner, as in the preceding situation. If the ship is in a set direction off the pier, let go all lines and allow the current to carry the ship broadside out into the stream.

BANK CUSHION AND SUCTION

Two other factors that are fundamental in ship handling are bank cushion and bank suction.

With a ship going ahead close and generally parallel to a bank, seawall, or another ship, bank cushion forces the bow out, and suction pulls the stern in. These forces are easily understood if one considers (1) how the bow funnels water into a narrowing area and (2) how screws suck in water from ahead and discharge it astern.

When backing down, the bank effect is reversed. Discharge current from the screws builds up a cushion at the stern, with the result that the stern goes out and the bow goes in.

When going ahead, bank cushion and bank suction can be counteracted by intelligent use of the rudder. Going astern, however, a combination of speed and rudder is required.

SINGLE-SCREW PECULIARITIES

The preceding topics on ship handling merely give an idea of some well-known idiosyncrasies of single-screw vessels. This training course cannot go into detail concerning unusual circumstances wherein a ship will act in a noncharacteristic manner. Habits peculiar to a particular ship must be learned from other conning officers and from experience.

STATION KEEPING

Regardless of the type of formation being maintained, each participating ship has her own definite position with respect to the guide and to other ships in the formation. Remaining in this prescribed position is called station keeping. Inasmuch as a station is located by its bearing and range from the guide, the basis of good station keeping is the continuous and accurate determination of the guide's bearing and range.

Because risk of collision is always a threat when ships are steaming in formation (often at high speed), the importance of exact station keeping cannot be overemphasized.

BEARING

Bearings prescribed for the type formation or by specific signal are reckoned either true or relative from the guide. For a ship that is keeping station on the guide, the prescribed bearing from the guide is converted to the bearing by gyro repeater, compass, or pelorus of the guide from the ship. This bearing is used constantly to check position.

DISTANCE

Prescribed range in a particular formation is that distance to be maintained between the guide and each ship of the formation. Normally, in formations other than circular, range will differ for each ship. Insofar as possible–without interfering with her safety or maneuver–a ship should endeavor to maintain correct distance from the guide, even though distance to ships in adjacent stations may be more or less than that dictated by the type formation.

INTERVAL

Interval is measured between unit guides or between columns or ships in lines abreast.

COURSE AND SPEED

Courses and speeds are included in the operation orders or are signaled. Adjustments in ordered courses must be made on individual ships, however, to compensate for compass errors. Numbers of revolutions for various speeds may be found in the engine revolution table, but numbers of turns must be altered to suit the circumstances. Factors that contribute to changing circumstances are the ship's draft and trim, condition of her bottom, and the state of wind and sea. It is much easier to maintain a reasonably accurate station than to regain position after losing it. To this end, therefore, it is much better to correct ship's position by immediate small changes of speed or course than to wait until position error is so great that radical changes are required. In fact, irregularity of speed and course produced by such radical changes causes most station keeping trouble.

Frequent and radical changes in speed are the most common error made by inexperienced conning officers. Because of her weight, plus resistance of the water, a ship does not respond as quickly as might be expected to increases or decreases in number of engine revolutions. Momentum causes a large ship to hold her way for some time after engines are stopped. A similar delay must be expected after minor rpm changes. The novice whose ship has fallen behind, and who is impatient to regain position, is likely to call for a larger increase than is needed. He continues running at increased speed until he is almost in position, forgetting that ships momentum will cause her to forge ahead for awhile even after a speed reduction is ordered. This drifting results in continual changes in speed, and keeps the ship either ahead or astern of position.

DETERMINING DISTANCE

Distance from the guide or from other ships in formation is determined by stadimeter, rangefinder, or by radar.

A stadimeter is used to measure distance (or range) of an object whose height is known. Masthead heights normally are listed in an instruction issued by a fleet or type commander. Stadimeters are of two kinds: Fisk type and Brandon sextant type.

The following description applies to the Fisk type. Operation of the Brandon type varies from the Fisk only in minor particulars.

Height in feet of an object whose distance is desired is set on a horizontal scale. When the object is viewed through a telescope, both direct and reflected images are seen. A thumbscrew is rotated until the top of the reflected image appears to be in line with the bottom of the direct image. Range in yards may then be read directly from the scale.

A radar, particularly one with a PPI (plan position indicator scope) is a help in station keeping and in maneuvering in general. Short radar ranges, approximately under 200 yards, cannot be seen, however.

Reports of distance should be given in yards, followed by information whether it is closing, opening, or steady. Use of the terms "increasing" or "decreasing" should be avoided, because of possible confusion with reports concerning bearings.

A conning officer must develop a sense of distance. Find some spot on the bridge to stand from which an object aboard ship, such as the jackstaff, can be lined up with objects on the ship ahead or to the side. When distance to an adjacent ship is measured, make a mental note (for future reference) of how the objects aligned. On dark nights there may be insufficient light for taking stadimeter readings, and radar ranges cannot be taken because of close proximity or perhaps radar silence is imposed. Binoculars can then be used to obtain a fair estimate of distance by judging the amount of field that the target ship fills. During the day, when exact distance to the adjacent ship can be measured, look at that ship through binoculars and note the amount of the field that she fills. Considerable practice is required to become proficient in this use of binoculars, but it is worth the effort.

CLOSE STATION KEEPING

The key to proficient station keeping in close formation is the mental process of visualizing simple problems in relative motion and solving them correctly. Although it is true that ships nowadays seldom steam in close formation, it still is an important requirement, and is demanded by most type commanders. Patrol and escort vessels, destroyers, cruisers, and amphibious ships must occasionally be able to steam in column or in line of bearing at standard distance, usually darkened at night and at high speed as well.

Steaming in close column demands a keen appreciation of speed and how your ship carries her way. It is largely a matter of speed adjustment.

If own ship is first in column, or is the guide, make every effort to ensure good steering and steady speed. Watch the helmsman carefully and, at the same time, see that proper revolutions are actually being made. Such efforts will be appreciated by the ship astern.

Keeping proper distance when following another ship depends largely on ability to detect early indications of opening or closing motion and making proper speed adjustments to counteract that motion. In this regard, remember that a ship following in the wake of another requires a few more revolutions that she will in still water, to make good the same speed as the ship ahead, because of the necessity to overcome wake turbulence or "kick" of the ship ahead. An erratic helmsman—who takes a ship in and out of the wake of the ship ahead—makes speed adjustment a difficult problem. A close watch must be kept on the helmsman for that reason. Make speed corrections with care, remembering that there is a time lag before the effect of change is felt. If allowance is not made for this time lag, the same error is likely to be corrected twice. That will result in a need for correction–probably larger–in the opposite direction. Once such surging starts, it is hard to stop. Study the time lag of own ship intently. Observe the effect of one correction carefully before applying another. Remember that excessive use of rudder acts as a brake. Always correct the steering before increasing speed.

In general, when in column, keep own ship inside instead of outside the prescribed distance. It is easier to drop back than to close up. Know allowable tolerances and keep within them. Remember the ship next astern, and keep own ship's course and speed as steady as possible.

Know own ship's proper station for column open order. Prescribed angles on the quarter of the leader are small, and there is a general tendency to exceed them. Check angles carefully and, when on station, make a mental note of the distance between the ship and wake of the guide.

When in column, always keep in mind own ship's number in the column and the side to which she should sheer out in an emergency. This position is the same side as that held when in column open order; it follows the standard pattern of odd ships to starboard, even ships to port. Any time own ship is uncomfortably close to the ship ahead, ease out her bow slightly on the side to which she would sheer out in an emergency.

Course changes for a formation in column may be made in two ways: by individual ships turning together, and by wheeling (changing course in succession, following the ship ahead).

When change of course is made by turning together, be sure to put on the proper amount of rudder promptly on execution of the signal. Inform the helmsman of the new course, and see that he does not swing past it nor use an excessive amount of rudder in meeting the swing. Either of these errors by the helmsman will cause the ship to end up behind bearing in the line of bearing resulting from the maneuver. Keep under constant visual observation the nearest ship toward which own ship is turning. As the turn progresses, check guide's bearing with a view to detecting promptly any tendency to gain or lose bearing.

In wheeling, when nearing the turning point of the ship ahead, remember that when she starts to turn, her stern will swing out. If own ship is properly in station astern of the guide, and the helmsman has been steering on her stern, order the helmsman (at the instant the signal for the turn is executed) to steady on a specified course. If own ship is not directly astern of the guide, take a bearing of the guide (at the instant the signal is executed), then order the helmsman to steer that course. This method will ensure own ship passing through the turning point of the guide.

Presuming that the ship ahead is the guide, or that she has followed the guide properly in her turn, own ship should attempt to turn in the same water. If the turning point has been approached correctly, the kick (swirl of water toward the inside of the turn caused when the rudder is put over to begin the turn) of the rudder of the next ship ahead will be observed to be slightly on own ship's inboard bow.

The one with the conn gets out on the wing of the bridge from which point can be seen, throughout the turn, both the ship ahead and the one astern. Own ship thus will be in the best position to observe the kick. Stay in that spot until decision is made to turn. When the kick of the ship ahead reaches a predetermined position abreast own ship (usually in the vicinity of the bridge), give the order to put over the rudder. The exact location of the kick in relation to the bridge varies in different types of ships. Thus, for any ship, it will vary with speed–all of which takes experience to judge.

After the rudder is put over, own ship will continue straight ahead for a short distance before she starts to swing. If the turn is timed correctly, she will follow around with the stem just at the inboard edge of the wake of the ship ahead. Normally, the outboard edge of the wake of the ship ahead can be lined up with a point on the jackstaff. If the edge draws downward along the jackstaff, the ship is going outside; if it draws upward, the ship is turning inside.

If the turn is made late, own ship's bow will start to go outside her proper turning circle. If this situation cannot be corrected immediately by a small amount of increased rudder, the wake of the ship ahead will strike own ship's bow and force her further outside. Under these conditions she should continue to make a standard turn outside and then steady up on the new course, still outside. When the ship astern completes her turn, own ship may start to ease back into place in column.

Once own ship's bow is outside the wake of the ship ahead, any attempt at correction by using increased rudder may result in falling back on the next ship astern. This condition is due to (1) the extra distance traveled and (2) the slowing effect of increased rudder.

If the turn is made too early, the bow will start to go inside the proper turning circle. A slight easing of rudder can correct this condition, but will decrease the slowing effect of own ship's rudder and she will be traveling a shorter distance. Thus she will close the next ship ahead. Easing the rudder should be done, therefore, only when distance from the next ship ahead is such that these factors will not cause own ship to come dangerously close.

A common error in such instances is to ease the rudder too much, with the result that own ship crosses the wake of the next ship ahead and goes outside. This condition can be avoided by watching closely for the first indication of turning inside, then promptly easing the rudder a sufficient amount to check rate of swing. As soon as this effect is produced, the rudder should ordinarily be put over again to the standard amount and the turn completed in a normal manner.

The only dangerous situation in turns arises when a ship is somewhat too close to the ship ahead when making a large change of course. The moment comes when a choice must be made between more rudder and remaining inside by slowing, stopping, or even backing the inboard engine, or the alternative of easing the rudder and passing under the stern of the ship ahead, and thus going outside her wake. In this situation, resolve any doubt in favor of continuing to turn inside. It is safer, and position eventually will be regained more quickly. By hesitating too long and then easing the rudder to go outside, own ship may forge ahead while her bow still is inside the stern of the ship ahead.

If the next ship ahead turned too soon or too late instead of following in her wake, own ship should attempt to turn correctly in the wake of the guide. Estimate how much too soon or too late—in terms of distance—the ship ahead made her turn. By applying this distance as a correction to the normal position of the kick of the next ship ahead when a normal turn is made, own ship can still use the kick as a reference point for turning.

As in other maneuvers, the turn in succession may be used to advantage in correcting position. When well behind station, boldly cut the corner. If too close, don't turn too soon. Instead, turn a bit late, with full rudder.

If the maneuver is executed in fog, or at night, it may be impossible to see the kick. As a precaution, use a stopwatch and start it when the signal is executed. Knowing the distance behind the guide and own ship speed, determination can be made of the time when own ship should arrive at the guide's point of turn. If no better information is available by that time, turn then. If whistle signals are being used and the signal of the next ship ahead is heard, note its time and use it as a new basis for computing time to turn.

When executing a wheeling maneuver, remember the axiom "never let own ship's bow get inside of the ship ahead." If this rule is adhered to, the dangerous situations and corrective measures outlined will not arise.

LINE OF BEARING

Station keeping is somewhat more complicated when in line of bearing. In this situation the conning officer is concerned with own ship's distance and bearing. A thorough understanding of the relative motion of ships is particularly beneficial. While steaming in close formation, rarely is there time to plot bearings and distances and obtain a solution if a ship is not in position. Then the problem must be visualized, and changes in course and speed made properly and promptly.

By lining up an alidade on the prescribed bearing of the guide and sighting through it, a conning officer can quickly determine whether his ship is ahead or behind bearing. If the line of sight falls ahead of the guide, own ship is ahead; if astern, she is behind.

When the line of ships is in line abreast formation, a speed that is greater or less than the guide's speed will cause own ship to advance or retard her bearing with negligible change of range. A slight change of course toward or away from the guide will cause her to close or open range with a slight loss of bearing. To counteract this small bearing change, a small temporary increase of speed (normally only a few turns) can be used, when desirable.

For lines of bearing between these two extremes–line abreast and column–the effects of a course of speed differential are somewhat more complex, because a combination of course and speed changes usually is required in order to maintain station.

When simultaneous turns are made in line of bearings, watch the ship toward which the turn is made in order to detect the first sign that she might be turning in the wrong direction.

ORDERS TO HELMSMAN

Nowhere in the Navy is usage of exact phraseology as important as it is to the conning officer in giving commands to the helmsman. Because misunderstandings or ambiguity can be so quickly disastrous, possibility of mistaken meaning must be eliminated. No confusion should occur when exact (and official) terminology is used.

The manner in which commands are given is important. Speak clearly, loud enough to be heard, and with a positive, incisive tone. The word helm should not be used in any command relating to operation of the rudder.

Commands to the helmsman are given in logical sequence. The first word ("Right" or "Left") indicates direction and enables the helmsman to start putting over the wheel at once. The second word signifies amount, as: "Right standard rudder." Chief purpose of giving the command in this manner is to ensure quick and accurate compliance of the helmsman. He starts turning his wheel instantly upon hearing "Right" (or "Left"). By the time rudder amount is specified, he can bring his pointer to rest on the exact number of degrees. Standard orders to helmsmen follow:

- Right (left) rudder: A command to apply right (left) rudder instantly, an indeterminate amount. This order must be followed instantly by stating the amount of rudder desired.
- Right (left) standard rudder: Standard rudder is the amount of rudder required to turn a particular ship within a certain prescribed tactical diameter. It is determined in advance for each vessel of a formation to ensure that all the ships in formation turn in the same space.
- Right (left) full rudder: Full rudder is a certain number of degrees greater than standard rudder. A rudder usually is capable of a 35° swing on either side of centerline, but full rudder seldom means more than 30° of rudder angle. The extra 5° is used only when absolutely necessary. The order requiring a helmsman to put on all possible rudder is right (left) "Hard rudder."
- Right (left) 5 (10,15,etc.) degrees rudder: This command is used in making changes of course and means turn wheel to right (left) until rudder is placed at the number of degrees ordered. The helmsman then is ordered to steer the new course. The complete command would be, for example: "Right five degrees rudder," "Meet her," "Steady as you go," "Steer course two seven five," or "Keep her so."
- Right (left) handsomely: Turn the rudder a small amount. The command is given when only a slight change of course is desired.
- Increase your rudder to — degrees: Increase rudder angle. This command is given when, with the rudder already over, it is desired to make her turn more rapidly. The command must be followed by the exact number of degrees of rudder desired.
- Meet her: Use rudder as may be necessary to check her swing. This command can be given when the ship is nearing her desired course.
- Ease your rudder: Decrease rudder angle. This command is given when the ship, turning with right (left) rudder, is turning toward or is nearing the heading desired. Example: "Ease to fifteen (five) etc."
- Steady; Steady as you go: Steer the course on which the ship is heading when the command is received. This command is given when, in changing course, the new course is reached or the ship is heading as desired. The helmsman responds: "Steady as you go. Course—, Sir."

- Rudder amidships: Rudder angle zero. This command is given when the ship is turning and it is desired to make her swing less rapidly.
- Shift your rudder: Change from right to left rudder (or vice versa) an equal amount. This command is given, for example, when the ship loses headway and gathers sternway, to keep her turning in the same direction.
- Mind your rudder: A warning that the ship is swinging to left (right) of course because of bad steering. It is also a command to steer exactly, using less rudder.
- Nothing to the left (right) of: A warning to the helmsman that conning officer does not desire the ship to be steered to the left (right) of the course ordered.
- How is your rudder: A question to the helmsman. He should reply: "Five (ten, fifteen, etc.) degrees right (left) rudder, Sir."
- How does she head, or Mark your head: A question to the helmsman. He should give ship's head at the time; for example "Two seven five, Sir."
- Keep her so: A command to the helmsman when he reports ship's heading and it is desired to steady her on that heading.
- Come right (left) to —: Put over the rudder right (left) and steady on new course —.
- Very well: Order given to helmsman, after a report by him, to let him know that conn understands the situation. (Never say "All right," which is unseamanlike language. Moreover it may be confused with a command to the wheel.)

All orders to the helmsman that specify a course or heading must refer to the compass by which he is steering at the time. Each course or heading is stated in three digits, whether three are actually necessary for its expression or not. For example, the order to steer 5° is not "Steer five," but "Steer zero zero five." A helmsman steering by a magnetic compass cannot be expected to differentiate between a true and a compass heading. He must never be required to apply any corrections. Before a new course is set, the conning officer must determine the compass course, and he must check it frequently thereafter for any possible change in variation and/or deviation.

The helmsman must repeat every order exactly as it is given, so that the conning officer will know that he heard it correctly. When an order necessitates a change of rudder angle, the helmsman not only repeats the order, but also reports when the rudder angle indicator shows that the rudder has assumed the desired angle. The rudder angle indicator is a dial, usually forward of the binnacle, which shows the angle assumed by the rudder. On the wheel itself there is usually a wheel angle indicator that shows the angle applied to the wheel. This angle is the same one the rudder will assume if the transmitting and steering engine mechanisms function properly.

ENGINE ORDERS

Orders controlling direction and speed of propeller(s) on a ship-sized vessel are transmitted

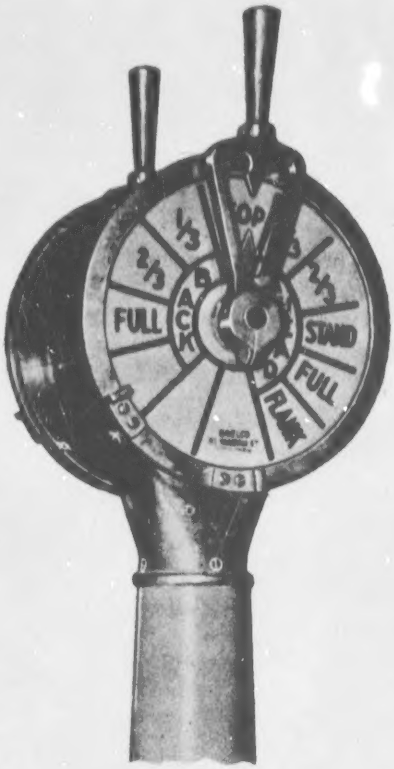

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Figure 7-22.—Engine order telegraph.

to the engineroom by means of an engine order telegraph (also called an annunciator) like the one shown in figure 7-22. Divisions on the face of the telegraph, which indicate various speeds ahead or speeds backing, are called sectors. The handle shown moves an indicator over the face of the telegraph. When the indicator is set to the desired speed, an answering pointer follows to the same sector when the engineroom complies with the order. In most Navy ships there are five speeds ahead, but only three backing speeds.

Contrary to the custom when giving orders to a helmsman, the words "port" and "starboard" are used when orders are given to the man operating an engine order telegraph on a twin-screw vessel. They are superfluous, of course, on a single-screw ship. For a single-screw ship each order is so worded that the desired propeller direction is stated first and the desired speed next: "Back–two-thirds"; "Ahead–full." A twin-screw ship is considered to have only a single engine on one side and a single engine on the other, regardless of how many engines she actually has. The engine to be affected is stated first, the desired propeller direction next, and the desired speed last: "Starboard engine–back–one-third"; "Port engine–ahead–full"; "All engines–back–full." ("All" is used instead of "both," because "both" could be mistaken for "port." "Back" is used instead of "astern" to prevent "astern" from being confused with "ahead.")

The man operating the telegraph (usually the lee helmsman) must repeat word for word any order he receives, and must also report when the engineroom has carried out the order. For example, when he gets the order: "Starboard engine ahead two-thirds," he repeats that order as he rings up the speed. When the answering pointer moves to the proper sector, he reports: "Starboard engine answers ahead two-thirds, Sir."

A ship with a single screw has only a single telegraph. A twin-screw ship may have a separate telegraph for the engine on each side, or she may have a single telegraph with a separate handle for each engine. When changes are made in setting, the handle must not be yanked sharply; a sharp pull may break the chain and disable the telegraph.

ENGINE REVOLUTION TELEGRAPH

One of the speeds ahead on the engine order telegraph shown in figure 7-22 is standard speed. Standard speed, like standard rudder, is a tactical amount. It is determined in advance for each ship of a formation to keep them all steaming at the same rate of advance. Full speed is a certain number of engine revolutions per minute greater than standard speed. Flank speed is close to the top speed that can be made by the engine controlled by that particular telegraph; usually its increase over full speed is the same as the increase of full over standard.

Despite the care with which standard speed is determined, frequently a ship steaming at standard speed in a formation has a tendency to close up on or fall behind the ship ahead. Speed changes shown on the telegraph are too drastic to take care of the small rpm changes necessary to overcome this surging. Consequently, on or near the telegraph there usually is a device called a revolution indicator, containing three small windows in which numbers appear. These numbers indicate the revolutions per minute to be made by the engines. When the revolution indicator is used, all engines are considered to be turning the same number of revolutions per minute.

Numbers in windows can be changed by turning a small knob on the indicator. Usually the previously determined number of rpm's required to make various calculated speed (full, standard, two-thirds, etc.) are listed on a table placed near the indicator. When one of these speeds is rung up on the engine order telegraph, the number of rpm's necessary to make that speed is also set on the revolution indicator. The engineroom answers on the indicator by setting the same number in a row of answering windows. When a minor increase or decrease in speed is necessary, the required change in rpm's is set on the indicator. The engineroom increases or decreases the rpm's and sets the new rpm in answering windows.

Because the revolution indicator provides for only minor changes in speed, it is not used in maneuvers like mooring alongside or mooring to a buoy, which require radical changes. When not in use, the revolution indicator is set to three zeroes, or to maneuvering position (usually three nines).

CHAPTER 8

PILOTING—ELECTRONIC NAVIGATION

Navigation, simply defined, is the art or science that enables a mariner to determine his ship's position, and guide her safely from one point to another.

This chapter deals with piloting and dead-reckoning. Definitions of these two terms are repeated here for familiarization.

- Piloting is navigation of a ship by using landmarks, various aids to navigation, and/or soundings.
- Dead-reckoning (DR-ing) is the method of finding a ship's approximate position by running a course line from her last well-determined position, using only courses steered, and computing distance run by utilizing engine speed and time. Effects of current are not taken into consideration when finding a DR position.

PILOTING

In piloting, a position usually is established by bearings taken on visible objects on the earth. If a ship is navigated by piloting, she ordinarily is in restricted and often dangerous waters. On the open sea there usually is ample time to discover and correct an error. In pilot waters, however, a navigational error may mean a collision or grounding. A JOOD must always keep these possibilities in mind, and impress upon his bridge watch the importance of precise and accurate information.

CHANNEL PILOTING

Quite often a pilot will come aboard ship to take her into port. He is a highly competent specialist, and has knowledge of the hazards of the waters being traversed. A pilot usually stations himself in the optimum conning position so that his observations and ship control orders can be given with minimum effort and confusion. He continuously determines the ship's course and speed and notes her position. A pilot realizes that channel piloting requires not only an accurate appraisal of present conditions, but continuous planning for the future as well. It must be remembered, however, that the presence of a pilot does not relieve the commanding officer and the navigator of ultimate responsibility for safe navigation of the ship. In a sense, the entire piloting team shares in this responsibility by being charged with furnishing accurate and timely information used in determining ship's position. All members of a piloting team must be constantly aware of the importance of their individual assignment.

OODs & JOODs must remain constantly on the alert, taking advantage of every opportunity to check and recheck the ship's position. Use the most detailed and up-to-date navigational chart available, and ensure that it is corrected completely. Well in advance of entering port, check carefully and become acquainted with information contained in *Sailing Directions*, *Coast Pilots*, and *Fleet Guides*. Carefully select from them any landmarks and navigational aids that can be used most effectively. Choose alternate aids in the event that primary choices prove unreliable or impossible to identify. On order from the OOD, a special sea detail should be set, and anchors should be made ready for letting go. An echo sounder should be energized and kept in readiness for immediate use. Any time the ship enters pilot waters, the chains should also be manned.

Whenever and wherever possible, use ranges for steering. Mark on the chart the courses to be steered and distances between points. Establish danger bearings for hazardous spots and shoal areas, and plot these danger bearing lines when no range is available for steering. Danger circles should be plotted, and regular courses should be planned. Never attempt to run haphazardly on indications of the danger angle alone, hoping to avoid trouble by random steering at critical points.

Even when entering port through channels that are considered safe, a ship's exact position must never be in doubt, but must be plotted accurately and continually on the chart. Otherwise, if a sudden squall or fog sets in, a ship should be in serious danger of grounding. Through experience, it has been learned that it is always best to steer planned courses and to change courses only at predetermined specific points. This practice facilitates piloting successively from buoy to buoy in limited visibility. If a ship fails to make a buoy on schedule, only one safe alternative remains: Stop; then anchor, or proceed with caution.

Course changes usually are made in exact amounts. That is, orders to the helmsman are stated in the amount of change or new course to be steered, instead of merely ordering the wheel put over. In the latter example, the order to steady may be forgotten or, still worse, the ship may be swinging and this condition may not be realized until too late to take corrective action. Even if corrective action is taken in time, a great deal of wild steering probably will result before she can be steadied again, and in pilot waters there usually isn't that kind of room for maneuvering. To avoid such a predicament, if the new course is not given (or during large changes of course), the helmsman should call out the ship's heading; for example, "Passing 130, passing 135," and the like.

When piloting in water where coral reefs or banks are numerous, it is helpful to select a time when the sun is astern. Normally, a ship is conned from aloft or from an elevated position forward. The line between deep water and the edges of coral shoals usually shows up in green patches, and it is readily seen from a height. This type of piloting is prevalent in many passages through the Florida Keys area.

When piloting, as stated previously, the special sea detail is set, and ordinarily a complete piloting team is stationed. All aids to navigation are used whenever and wherever possible. Several navigational methods are utilized by a ship to fix her position. These methods, which may be used either separately or collectively, are as follows:

1. Bearings: visual, radar, sonar.
2. Ranges: visual, radar, sonar.
3. Depth of water: echo sounder, lead line.

COAST PILOTING

The preceding information is useful in both coast piloting and channel piloting. Several additional techniques, applicable chiefly to coast piloting, are mentioned here.

One of the better methods, from a navigational point of view, is to steam along a well-defined and well-surveyed coast instead of steaming out to sea. This plan enables a navigator to keep visible landmarks continually in sight and to determine his ship's position accurately and maintain a continuous check of that position. Additionally, such a procedure presents a more accurate and detailed radar picture to assist a navigator in this transit. By steaming too far offshore he may lose sight of prominent landmarks or other aids to navigation. Consequently, he must make landfall from a doubtful position, and such a task can present some anxious moments. Moreover, the radar picture is not as detailed when steaming too far offshore. If the navigator encounters fog, squalls, or any other inclement weather where visibility is reduced, he may have serious difficulty making a predetermined landfall. If, however, he encounters conditions of restricted visibility while steaming along the coast, he knows his position, and also knows the speed he is making good. Thus, he is in an ideal spot to navigate by dead-reckoning. (This method of navigation is discussed later in this chapter.) This mode does not, of course, preclude the use of other aids to navigation available to a navigator. In this instance, radar and an echo sounder prove their worth as navigational aids.

If navigation charts are known to be accurate, but a ship encounters heavy weather, it is advisable to skirt the coast as closely as safety permits, thus gaining the advantage of quieter waters usually found along the coast. This same procedure ordinarily will avoid strong adverse currents running offshore. Naturally, the track along the coast should be planned for normal weather conditions, but provisions should be made well in advance for any possible variations. When a ship makes frequent runs over the same route, the navigator should note and retain courses and distances laid down on the charts, as well as effects of current or tides. All data should be recorded in a notebook for immediate reference.

All ranges along the coast are plotted whenever they may be useful for determining position, for purposes of safety, or for checking compass deviation and gyro error.

Course changes quite often take place when a preselected point along the coast comes abeam. (This is the instant when position for a new departure is determined most easily.) If a ship is not equipped with gyro repeaters, ensure that a pelorus (dumb compass) is set to the ship's true heading and is ready for taking bearings at all times. Before taking any bearings, bearing takers should check the pelorus to ensure that it is set on the ship's heading. The navigational chart should be readily available for reference by all pertinent bridge personnel. A sextant should be set to the danger angle and be ready for immediate use. See that a recorder keeps a complete record of all bearings on specific points, the time they are taken, and the distance when they come abeam, and that he records all data in the bearing book.

Although coastwise piloting becomes a matter of routine—not requiring the constant presence of the captain or navigator—it nevertheless is wise to bear in mind continually, and impress upon the men, the consequences of any laxity on their part. Wrecks marked on the chart attest to the consequences of errors. Groundings occur all too frequently, but remember—and remember well—that they usually are inexcusable.

TAKING BEARINGS

A gyro repeater is used to take bearings on any stationary visible objects that help to fix the position of a ship during piloting. These bearings also may be taken by utilizing a magnetic compass or a dumb compass. A gyro repeater is considered the best method and is the one used most commonly. All bearings taken with the gyro repeater are true, and may be plotted directly on a chart without conversion except for gyro or repeater error.

Ships not equipped with a gyrocompass (district and small craft) normally take bearings with a pelorus. If the dumb compass card in the pelorus is set to a ship's heading, bearings obtained are the same as they would be by magnetic compass, provided that the ship is exactly on course. Instruct the men to take bearings only when the ship is on an even keel, not yawing, and when the bubble in the spirit level on the azimuth or bearing circle is centered. Only by constant practice can the men develop the ability to take exact bearings in a seaway.

Bearings by Gyro Repeater

The master gyro usually is situated below decks in the IC room, and consequently is unavailable for taking bearings. Gyro repeaters are located on both wings of the bridge, however, and they are synchronized with the master gyro and read the same as it does. When the master gyro and repeaters function properly, all bearings taken on the gyro repeaters are true bearings. Hence, there is no necessity for applying ship's heading or converting compass bearings to true bearings. If, for any reason, a gyro repeater should become inoperative, it can be disengaged from the master gyro and used as a dumb compass.

Bearings by Pelorus

When a ship is not equipped with a gyro (as already mentioned), the dumb compass card in the pelorus is set to ship's heading, and the bearing by pelorus is the same as it would be by magnetic compass, provided the ship is exactly on course. This situation seldom happens at the instant the bearing is taken, hence any bearing obtained by pelorus must be corrected by the number of degrees the ship was off course. It follows, then, that a ship's actual heading at the instant of taking a bearing must be known. A common method of taking bearings by pelorus is described in *Quartermaster 3&2,* NAVPERS 10149.

Bearings by Magnetic Compass

When a magnetic compass is so situated that a bearing taker's vision is unobstructed, it may be used to take bearings. The magnetic compass is mounted on the centerline of the ship, and usually is surrounded by superstructure, hence vision rarely is unobstructed.

When using a magnetic compass, make sure that bearings are taken directly from the compass and that bearing takers note the time. Compass bearing is then converted to true bearing and plotted. Bearing takers should determine compass error before taking the bearing, so that no time is lost in converting from compass bearing to true bearing. Ordinarily the helmsman is so close to the course that deviation is not affected. If, during heavy weather, for instance, the ship at the time of bearing is radically off course, it may become necessary for the men to work another correction problem, using a different deviation from that expected. To determine correct deviation, they should instruct the helmsman to note ship's heading when they sing out "Mark!" as they take their bearing. An assistant navigator should hold frequent drills in this procedure, and thus ensure that his navigation team is thoroughly familiar with procedures and mechanics of taking bearings with a magnetic compass.

PLOTTING BEARINGS

Before proceeding to the various methods of fixing a ship's position in piloting, some discussion of plotting bearings on a chart is necessary. A Signalman First may already have acted as JOOD and is well aware of plotting procedures. For him this topic is a review; but, for the majority of SMs, this is the first time they have actively and continually plotted own ship's position. This is also the first time they have acted as JOOD.

Bearings are always plotted as true. If a ship does not have a gyrocompass, all bearings must be converted to true before they are plotted. It is the outer ring of the compass rose on the chart that registers true bearings. Only that ring is used in plotting.

Assume that a ship is steaming along a certain coast, and lighthouse X is sighted visually off her starboard bow. Take a bearing on the lighthouse through an alidade, using the starboard wing repeater. In the bearing book, record the bearing and time, as well as the identity of the light. Then commence to plot the bearing on the chart. If using a drafting machine make sure it is aligned 090° to 270° with one of the latitude lines of the chart. Rotate the protractor arm to the bearing obtained from the alidade. On the chart simply draw a line, along the protractor arm, from the lighthouse until it intersects own ship's course line. This line is not a fix; it is only a line of position, and own ship's position is somewhere along that LOP. When using parallel rulers in lieu of a drafting machine, align them on the compass rose of the chart to the bearing obtained from the alidade. The walk the rulers across the chart until the edge of one passes through lighthouse X, and draw a line intersecting the course line. Below the line, label the line of position with the bearing. Above the line, designate the time the bearing was taken.

As stated previously, ship's position still is unknown. The only known information is that she is somewhere along the plotted line of position at the time of the bearing. If, however, a bearing of another object is obtained at the same time as the bearing of lighthouse X, or a radar range of the lighthouse is obtained simultaneously with the bearing, the intersection of the two lines of position or of the line of position and radar range, will give a fix. This fix establishes the exact location of a ship. These and other methods of fixing position are described later in this chapter.

The method of plotting a bearing by means of parallel rulers is shown in figure 8-1. At 0915 own ship obtains a compass bearing of 288° on lighthouse C. Variation is 15° E; deviation is 3°W. The algebraic sum of variation and deviation is 12° E. When correcting, always add easterly compass error. Add 12° to 288° to obtain a true bearing of 300°. If a gyro repeater had been used, this conversion would have been unnecessary.

To go through the procedure of plotting the bearing shown in figure 8-1, place parallel rulers with their upper edge passing through the center of the compass rose and the 300° mark on the outer ring (AB). Walk the rulers, and mark above the line the time of bearing (0915). Below the

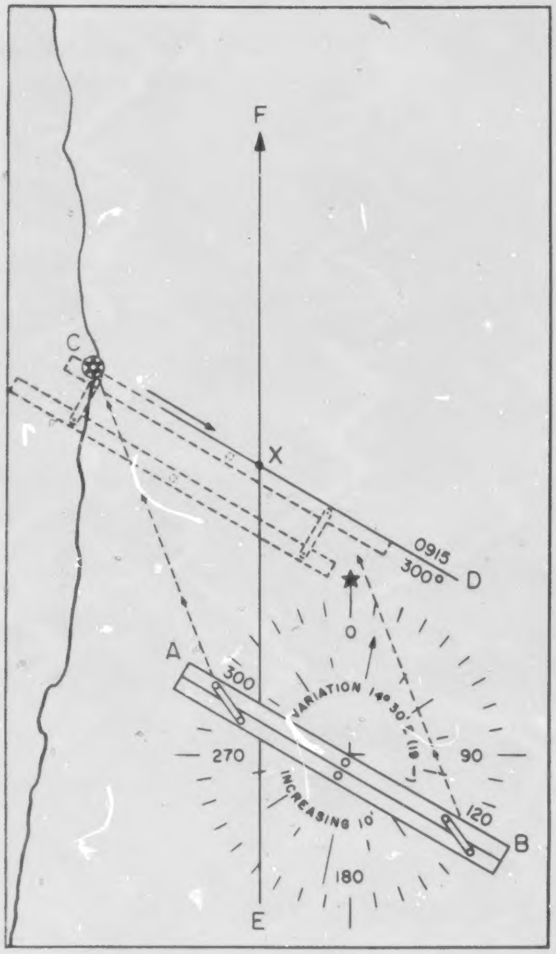

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Figure 8-1.—Plotting bearings.

line, mark the number of degrees of bearing (300°). At 0915 the ship was somewhere on this line of position (LOP). Line EF represents ship's course. If the ship has made good her course and speed and has not made any leeway, point X (where the line of position intersects course line) is her actual position. Although this intersection is considered an ideal condition, it rarely ever exists consequently the intersection at point X cannot be considered an accurate fix.

FIXING POSITION IN PILOTING

Proper labeling of all points and lines made on charts or plotting sheets is essential in order to avoid confusion. Immediately after drawing a line or plotting a point, label it. A label for any fix should be at the fix instead of along a line leading to it. For instance, above the course line put a C, followed by three figures indicating true course in degrees. Below the line place an S and ship's speed in knots.

It is known that a single line of bearing gives an LOP, and somewhere along that LOP is ship's position. It also is known that an accurate fix of ship's location cannot be obtained by a single line of position. To plot an accurate fix, therefore, two or more interesting LOPs or radar ranges must be obtained. Needless to say, the greater the number of lines of position or ranges interesecting at the same point, the greater is the confidence in the fix.

An additional LOP for establishing a fix may be obtained by several methods. An assistant navigator should know them completely, and should ensure that his men also know them. If a bearing is taken at the same time a ship crosses a range, the point where the bearing crosses the true bearing of the range is a fix. Always make sure that the forward and after range marks are lined up when the bearing is taken.

Another way of obtaining a fix is by using a range (distance) to the same object on which a bearing was taken. This range may be obtained by using radar, rangefinder, or stadimeter. If a stadimeter is used, height of the object must be known. The range to the object on which a bearing was obtained is displayed as a radius of the circle swung as an arc. This arc is the second line of position; the bearing is the first LOP. Thus, the point where the arc intersects the bearing is a fix.

METHODS OF FIXING POSITION

The two most common methods of fixing a ship's position in piloting are discussed in the ensuing topics.

Cross Bearings

In figure 8-2, points A and B represent two well-defined objects on which bearings may be

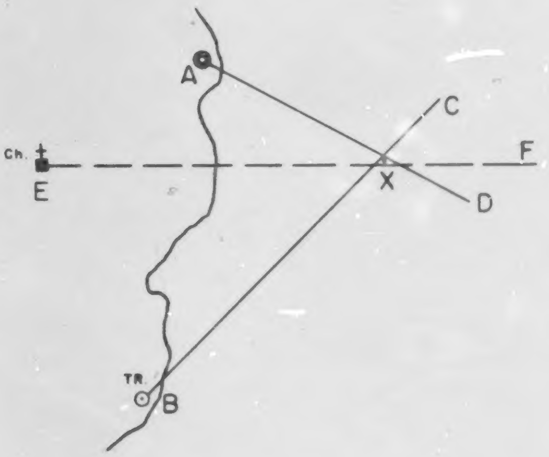

Figure 8-2.–Cross bearings.

taken. Using a bearing circle or an alidade, take bearings on each object, one as quickly as possible after the other. If two alidades are manned, bearings on two objects are taken simultaneously. If a dummy pelorus is used, make sure bearing takers convert bearings to true before they are plotted. Plot these two bearings as AD and BC. Their point of intersection, X, is a fix and thus is ship's position.

A more accurate fix may be obtained by taking a third bearing on another well-defined object, E, and plotting bearing EF. As shown in figure 8-2, three lines of position frequently form a small triangle instead of a pinpoint fix. Ship's position is then considered to be in the center of the triangle.

Depending upon height of tide, draft of ship, and contour of bottom, reliability of a fix may be further verified by taking a sounding at the instant of bearing. If the same depth of water is obtained as shown at point X on the chart (after taking ship's draft into account), in all probability it is an accurate fix.

The most reliable fixes are obtained from cross bearings that differ by approximately 90°. Bearings differing by 30° or less, or by more than 150° are undesirable in obtaining a fix, because they are too nearly parallel to result in an accurate fix. They should be used, however, if they are the only bearings obtainable.

Bearing and Distance

It was learned earlier that a bearing and a range on the same object will give a fix. With radar or an accurate range finder, distance can be determined to an object on which the original line of position was obtained. Intersection of this range swung as an arc with the original line of position gives a fix. Figure 8-3 shows a fix using a bearing and distance of a single known object. Line AB represents the bearing of lighthouse A. Arc CD represents range to the lighthouse. Point X on the chart is the actual position or fix. When using this method to obtain a fix, remember to obtain bearing and range simultaneously.

LEADERSHIP RESPONSIBILITY

It is not the intent of this chapter merely to describe the importance of reliable navigation nor the methods of navigation employed in piloting. Rather, it is the purpose of the text to impress upon you the ease with which safe navigation may be accomplished under ideal conditions. In connection with safe navigation, your responsibilities as JOOD never permit laxity of any sort to appear in the procedures utilized by your men in what erroneously is considered routine navigation.

Piloting is routine only insofar as it concerns piloting methods. It must never be considered routine in the attitudes of your men. Piloting demands a keen appreciation of all the limitations of the equipment, as well as a knowledge of the inherent dangers resulting from being lulled into a false sense of security. You must impart your awareness to your men. When they possess it, safe navigation will, in fact, become a reality. Thus, a routine situation becomes routine only in respect to built-in dangers and the steps taken to avoid them.

RADAR

Radar (derived from radio detection and ranging) was developed as a means for detecting and ranging targets in warfare, but it has progressed to the point where it is a valuable electronic navigational aid. The principle of

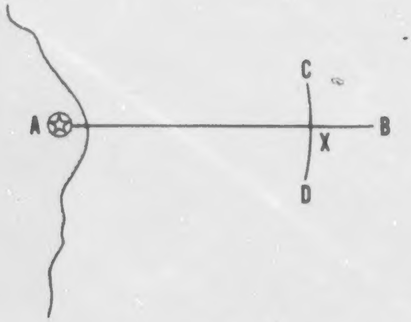

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Figure 8-3.—Bearing and distance of single known object.

operation (figure 8-4) is based upon reflected radio waves. It has the advantage over loran of not requiring any shore transmitting stations. Radar's chief disadvantage is that its maximum range, for a surface vessel, is limited to the line-of-sight of the antenna.

HOW RADAR WORKS

Basically, radar employs very short electromagnetic waves, and utilizes the principle that these waves can be beamed, that they travel in a straight line, and that they will be reflected by any discontinuity in the medium through which they are transmitted. Because Signalmen are interested chiefly in navigational aspects of radar, only a general description of how radar works is given here.

A typical surface radar is made up of five components: transmitter, modulator, antenna, receiver, and indicator. A transmitter consists of a radiofrequency oscillator, which sends out electromagnetic waves of energy. A modulator is a device that makes it possible for these waves to be emitted as pulses. The antenna assembly is so designed that it beams energy at the target, much as a searchlight is beamed. It also can be rotated so as to scan the entire area around it. In the receiver, reflected radio energy returned from a target is converted into a pip that may be presented visually on an indicator or scope.

PLAN POSITION INDICATOR (PPI)

Although there are many ways of presenting radar information visually, the plan position indicator (PPI) is considered the most practical from a navigator's point of view. Figure 8-5 shows a view of objects in the area around a ship as they are presented on a PPI scope. The ship's own position is in the center of the scope.

RANGE AND BEARING BY RADAR

A PPI is designed to enable a navigator to determine range and bearing of an object, which is one of its chief navigational advantages. The scope can be adjusted to several different range scales. Range is measured to scale from the center of the scope to the target indication.

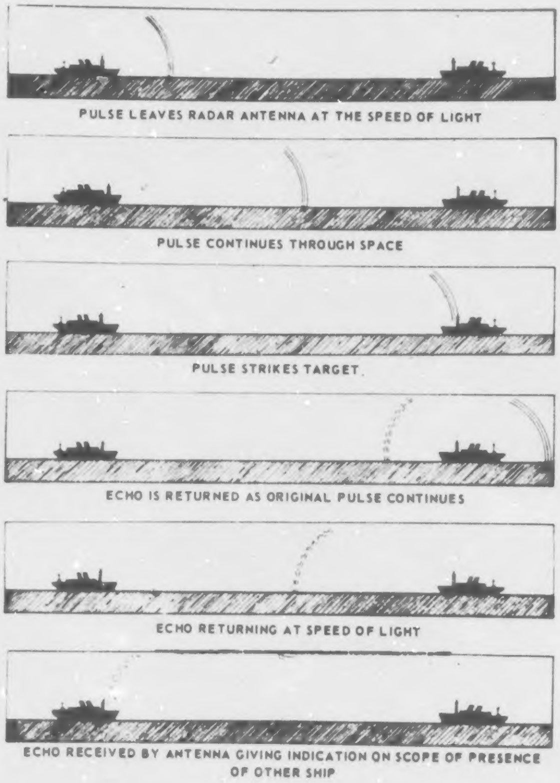
PULSE LEAVES RADAR ANTENNA AT THE SPEED OF LIGHT
PULSE CONTINUES THROUGH SPACE
PULSE STRIKES TARGET
ECHO IS RETURNED AS ORIGINAL PULSE CONTINUES
ECHO RETURNING AT SPEED OF LIGHT
ECHO RECEIVED BY ANTENNA GIVING INDICATION ON SCOPE OF PRESENCE OF OTHER SHIP

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Figure 8-4.—Principle of radar operation.

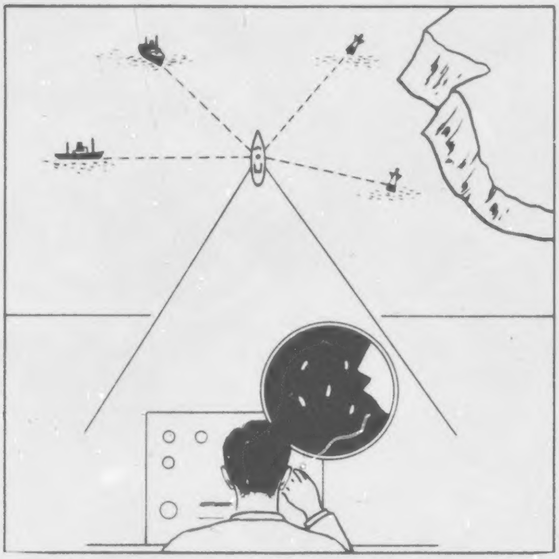

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Figure 8-5.—A PPI presentation.

Figure 8-6 shows bearing and range markers on the face of a PPI scope. Bearing is indicated by figures around the edge of the screen. Usually lines radiating out from the center are ruled on a transparent shield placed over the face of the scope.

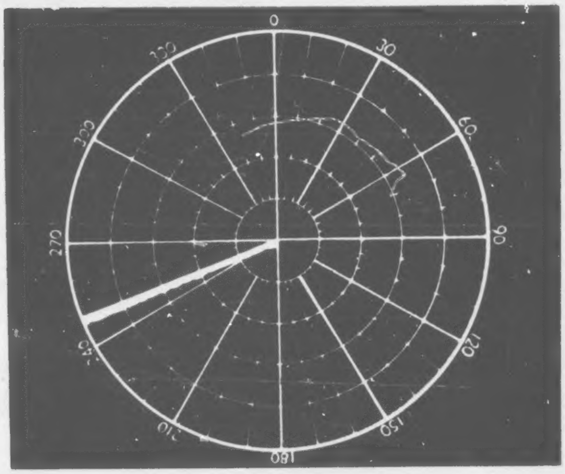

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Figure 8-6.—Bearing and range markers on PPI scope.

Bright rings seen in the illustration are range markers or range rings. Range markers can be switched on or off, thus controlling their brightness as needed. Range indicated by each ring depends, of course, on the scale used. If each ring represents 5000 yards, for instance, the outer range here is 25,000 yards. A target halfway between the third and fourth rings is at a range of about 17,500 yards.

Range Strobe

Range markers do not provide an exact means for finding range of objects shown on a PPI scope because of the necessity for interpolation by eye when indications of such objects lie between markers. To remedy this error, a range strobe is used on some types of PPIs. A range strobe is a small, bright spot that can be moved by turning a handcrank. A strobe is cranked to a target indication and range is read directly from a mechanical counter connected to the handcrank. A range strobe adapts itself to any range scale.

Bearing Determination

As mentioned earlier, bearing is indicated on a PPI scope by figures around the edge of the screen. On gyro-equipped ships (most ships having radars are so equipped), this bearing circle is a gyro repeater, and bearings obtained from it are true. In the event of gyro failure, relative bearings may be taken from a relative bearing ring.

Bearing Cursor

To facilitate accurate reading of bearings on a scope, an electronic bearing cursor is provided. Purpose of this cursor is to obtain bearing of targets. The electronic cursor appears on the PPI as a sharp line whose direction may be set by the bearing cursor control. The bearing is read directly from a mechanical counter. The range strobe moves with and along the bearing cursor and range is read as described previously.

PILOTING BY RADAR

Well-determined positions by radar are labeled fixes. Positions that are not well-determined, or less reliable ones, are labeled EPs (estimated positions), depending on a navigator's judgment. Leading Signalmen know that radar bearings are always less accurate than visual bearings. Radar ranges, however, are exceedingly accurate. Consequently, a fix obtained by a method in which two or more lines of position are determined from range is always more accurate than one obtained from one range and radar bearing or from radar bearings alone.

Three common methods of determining position by radar are—

1. Range and bearing of a single object.
2. Two (or more) bearings.
3. Two (or more) ranges.

Range and Bearing of a Single Object

Both a bearing and a range are obtained from a single observation by radar. Intersection of this bearing and range is a fix. Because of inherent inaccuracies of radar bearings, a more accurate fix can be obtained if a visual bearing is used to intersect a radar range. If only a single small object is available, however, a radar range and bearing may be the only method of determining own position. If the target is a small, well-defined island or a point of sufficient width, a more accurate fix can be obtained by plotting tangent bearings and range. (See figure 8-7.) But, because of beam width distortions, tangent bearings usually intersect at a point less than the measured range, thus forming a small triangle. Own position is then considered to lie on the measured ranges midway between bearing lines, not in the center of the triangle, as in other types of fixes, because the range is considered more accurate than the radar bearings.

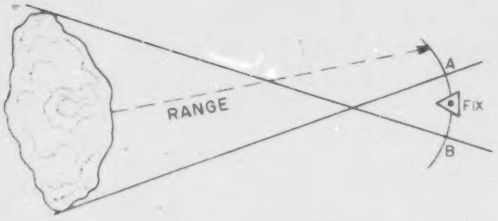

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Figure 8-7.—Tangent bearings and range.

Two or More Bearings

Two or more bearings by radar are plotted in the same manner as visual bearings. This method is the least desirable and least accurate method of obtaining a radar fix. For these reasons, this method should be avoided if a more accurate method can be utilized.

Two or More Ranges

Two or more radar ranges provide the most accurate fix that can be determined by radar. When this method is used separately or in connection with visual bearings, it produces reliable fixes. When piloting, always remember that ranges taken from a coastline may be inaccurate because of the reasons stated previously. For these same reasons, then, always try to use a small, well-defined object that can be plotted accurately from the exact point of echo. Whenever practicable, try to supplement radar ranges with visual bearings. Chances are slim that fixes will be erroneous when two or more radar ranges and visual lines of position are used. Keep in mind, and impress in the minds of strikers that the more methods used simultaneously in obtaining a fix, the more accurate will be own position.

Figure 8-8 shows how a device can be constructed easily aboard ship for speeding up plotting of two ranges. Pivot two transparent plastic arms at a common point and drill a small hole at the pivot, just large enough for inserting a pencil point. Calibrate the arms to the scale of the chart, with zero range at the pivot. To plot a fix, simply place the plotter on the chart so that observed range from each target is exactly over that target's indication on the chart. The hole in the pivot then will be located at the fix.

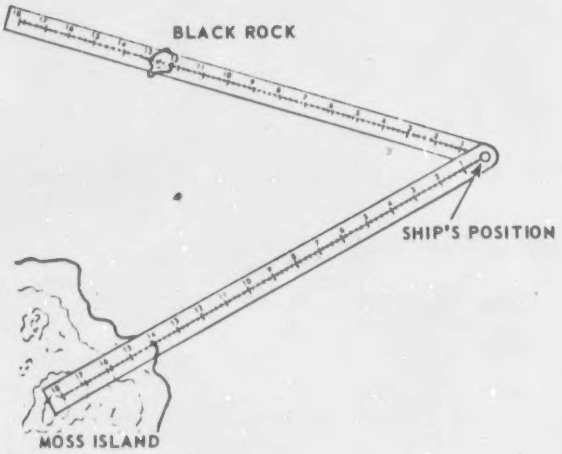

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Figure 8-8.—Plastic plotter for determining position from ranges.

NAVIGATIONAL RADAR TARGETS

Small isolated rocks are excellent targets for center bearings and ranges. They are well-defined small objects that can be plotted accurately from the exact point of echo. Small islands are also good, but large ones require tangent bearings instead of center bearings.

Sharp points of land often are used for ranges and for either tangent or center bearings. In ranging on land, be certain to plot a range arc from the point that actually produced the radar echo. Sometimes what appears to be a waterline on a radarscope is, in fact, being reflected from some point inland, or possibly from a surfline offshore.

Buoys present echoes much like small rocks. Buoys may go off their stations for a number of reasons, however, and are not considered good references for purposes of obtaining fixes.

Offshore lighthouses on rocks or pilings are reliable radar targets, and are also easy to identify. Large charted buildings, tanks, towers, and the like often can be picked up by an experienced operator, even though located some distance inland.

When distant mountains are the only objects available, bear in mind that it is difficult to get an accurate range from such a large mass. Bearing inaccuracy may also be considerable under such circumstances.

INTERPRETING RADAR INFORMATION

Interpreting radar information requires considerable experience. Even then an operator may not always be able to interpret correctly. Bearing resolution, range resolution, and radar shadows are but three problems that hinder radar interpretation.

BEARING RESOLUTION

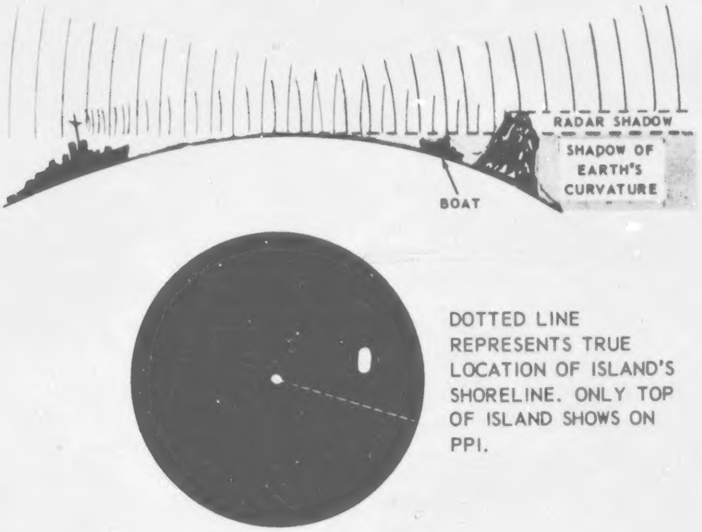
A radar beam width causes a target to appear larger than it actually is. If two targets are close together and at about the same range, their pips may merge and form a single pip indicating a large target. Minimum difference in bearing between two objects at the same range that can be discerned on the scope is called bearing resolution. A number of rockpiles and small boats near shore may appear as a straight line, giving a false impression of the shoreline.

RANGE RESOLUTION

Minimum difference in range between two objects on the same bearing that can be discerned by radar is called range resolution. Two or more objects on the same bearing and at only a slight difference in range may appear on the scope as a single long object.

SHADOWS

Radar shadows occur behind prominent objects. No echo is returned from an object that lies behind another object that obstructs a radar beam. Nor can small boats or rocks that lie a considerable distance beyond the horizon be picked up by radar. Figure 8-9 shows a boat that cannot be located by radar because of shadow effect. In the distance, the radar picks up the top of an island, but the bottom is in the shadow created by the earth's curvature.



DOTTED LINE REPRESENTS TRUE LOCATION OF ISLAND'S SHORELINE. ONLY TOP OF ISLAND SHOWS ON PPI.

69.54

Figure 8-9.—Radar shadow.

ADVANTAGES OF RADAR IN NAVIGATION

When used for navigational purposes, radar has distinct advantages over other types of navigational equipment. Several of these benefits are given in the following list.

1. Normally, radar can be used when other methods are unavailable; for example, at night and during periods of low visibility.
2. Because both a range and a bearing are provided by radar, a fix can be obtained from a single object.
3. With the PPI, a continuous position is available, and radar fixes can be obtained quite rapidly.
4. At times radar navigation will be more accurate than other methods of piloting.
5. Usually radar can be used at greater distances from land than nonelectric methods used in piloting.
6. Radar is a helpful anti-collision device, giving a presentation of the surrounding area on a PPI scope, even during periods of reduced visibility. Radar alone does not prevent collision or modify Rules of the Road.
7. Radar can be used to locate and track squalls and nearby tropical storms.

DISADVANTAGES OF RADAR IN NAVIGATION

When applied in navigation, radar also has certain limitations and disadvantages. They must constantly be kept in mind. Never rely on radar alone if other methods of navigation can be used simultaneously. Following are some disadvantages.

1. Radar is subject to mechanical and electrical failure.
2. There are limitations to both minimum and maximum ranges.
3. To interpret properly the information presented on the scope is not always easy, even after an operator becomes proficient at it.
4. Sometimes radar is not as accurate as other methods of piloting. For instance, a visual bearing is more accurate than a radar bearing.
5. Radar, during unusual atmospheric conditions, may be unreliable.
6. Information necessary for identification of radar targets is not always given on charts.

7. Small boats, buoys, and the like cannot be detected easily by radar, especially if a high sea or surf is running or if they are near shore.

ACCURACY OF RADAR

Accuracy of positions obtained by radar, when used in navigation, varies with different types of radar and skill of operators. A radar may be used directly for navigation, hence operators should understand those problems influencing its accuracy.

In the majority of circumstances, accuracy of radar fixes compares favorably with fixes obtained by other means. Limitations of each radar set should, however, be understood thoroughly by everyone who is depending on it for information. Some factors affecting accuracy of specific radar information follow.

1. Beam width: Although radar signals are directional, they are transmitted as fan-shaped narrow beams. Echoes are received continuously by a radar as its beam sweeps across a target.

2. Pulse length: Pulse length affects the depth of a pip appearing on a PPI.

3. Mechanical adjustment: Radar sets, although ruggedly constructed, are nevertheless rather sensitive instruments, and they require accurate adjustment. Remember, error in adjustment usually causes error in readings obtained.

4. Interpretation: Even with proper training, a person operating a radar may not always find it easy to interpret an echo properly. Two of several influences that make this problem difficult are bearing and range resolution. Another problem is false target indication. False shorelines may appear on the scope because of a pier, several small boats, or heavy surf over a shoal. A shoreline may appear some distance inland at bluffs or cliffs back of a low, flat, or sloping beach. False shorelines also make inaccurate radar ranges or bearings from points along a shore. Never be lulled into a false sense of security merely because the closest range to land is obtained. A false shoreline may actually appear, and there may be several hundred feet of low beach extending outboard, none of which was picked up by own radar.

LIMITATIONS IN RANGE

Ranges, both minimum and maximum, are limited. Minimum ranges are determined by technical features built into a radar set. Such features include recovery time, side lobes, echoes, and vertical beam width. Certain other physical conditions also affect minimum range. Examples are obstruction and sea return. Maximum range usually is limited by curvature of the earth to the line of sight and depends to some extent on the height of the radar antenna above the surface of the water. Moreover, such technical features as output power, pulse width, and frequency affect maximum range.

DEAD-RECKONING

Dead-reckoning, to repeat, is the method of establishing your ship's approximate position by running a course line from your last well-determined position, using only courses being steered, and computing the distance run by using engine speed. A DR position is plotted on the course line drawn from your last well-determined position (point of departure or fix). A dead-reckoning position will be as far along the course line as you find you have traveled. In other words, it is the place where you would be if you had made no leeway whatever and if you had steamed exactly at engine speed. Unfortunately, this ideal is seldom true, because your ship is affected by many of the elements found at sea.

DR TRACK LINE

The course line laid out from a fix is a line generated by the constantly moving DR position, called the DR track line. Until another fix is obtained, the DR track line continues as a graphic history of the course that was steered and the speed that was used. Meanwhile, winds, currents, steering errors, etc., combine to set your ship to one side or the other of the course, and to vary the actual distance traveled. You readily can understand, therefore, that it frequently is necessary to fix your ship's position, commencing a new DR track from each new fix.

When no fix can be obtained, you should continue your DR track for an entire watch or until you get a new fix, then start a new DR track. You may be unable to obtain a fix for as long as 12 hours or more. If you cannot, the DR track is continued for the entire period. Necessity for continuing the track is especially true when you are steaming in restricted waters, where dangers exist near your ship's track. Even in unrestricted waters, one of your shipmates may go overboard, or some other casualty may occur, necessitating that you plot your ship's approximate position instantly. If your DR track is not up to date, you may have to plot your DR track from your last known position. You may also have made course or speed changes in the interim, making it necessary to consult logs to obtain the information to continue your DR track, which exhausts valuable and perhaps unavailable time.

When standing JOOD watches underway, it may be necessary for you to draw a dead-reckoning (DR) track or keep the DR current during tactical evolutions.

The method of keeping a DR track line is explained (by example) in the following discussion. Refer to figure 8-10.

A naval vessel engaged in maneuvers desires to arrive at 46°10'N. latitude, 179°46'E. longitude at 0800 on 26 June. Conditions of weather make it impossible to get a celestial fix, and no electronic aids to navigation are available. The ship's last well-defined position was at 45°50'N. latitude, 178°09'W. longitude at 0400 on 25 June.

Departure from this point is taken on course 312°T, speed 15 knots.

At 0800, course is changed to 328° T and speed is changed to 12 knots.

At 1300, course is changed to 009°T.

At 1500, speed is increased to 18 knots.

At 1700, course is changed to 040°T and speed is increased to 20 knots.

At 1745, speed is reduced to 10 knots.

At 1915, course is changed to 194° T and speed is increased to 12.4 knots. The ship continues on this course and speed until she arrives at the rendezvous point at 0800 the next day.

The situation just outlined is for illustrative purposes only. Rarely is a ship unable to get a fix or a line of position over such an extended period. Additionally, set and drift would probably have put the ship somewhere other than at her DR position. Even so, lacking any method of determining the ship's position more accurately, the DR method must be used.

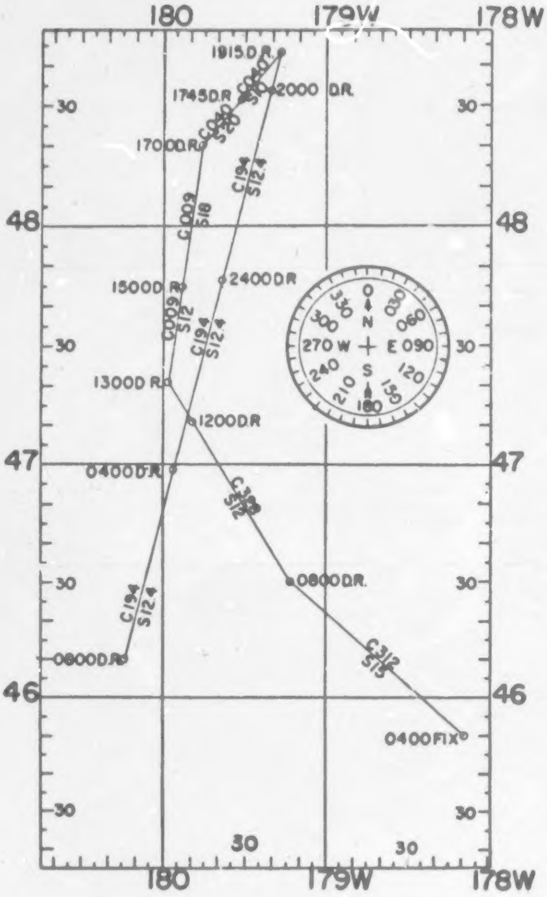


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Figure 8-10.—Plotting DR position.

ADVANTAGES OF DEAD-RECKONING

Dead-reckoning cannot, of course, locate your position as accurately as can the methods employed in piloting, celestial navigation, or electronic navigation. Nevertheless, it remains a valuable aid to the navigator, the OOD, and to you as a JOOD. Dead-reckoning affords a means of plotting your ship's position at any time between accurate fixes, and also gives you the approximate position of your ship at the time you are obtaining an accurate fix–a necessity in celestial navigation. Excluding electronic systems and aids, it is the only method for plotting your approximate position during periods when weather conditions are unsuitable for visual observations.

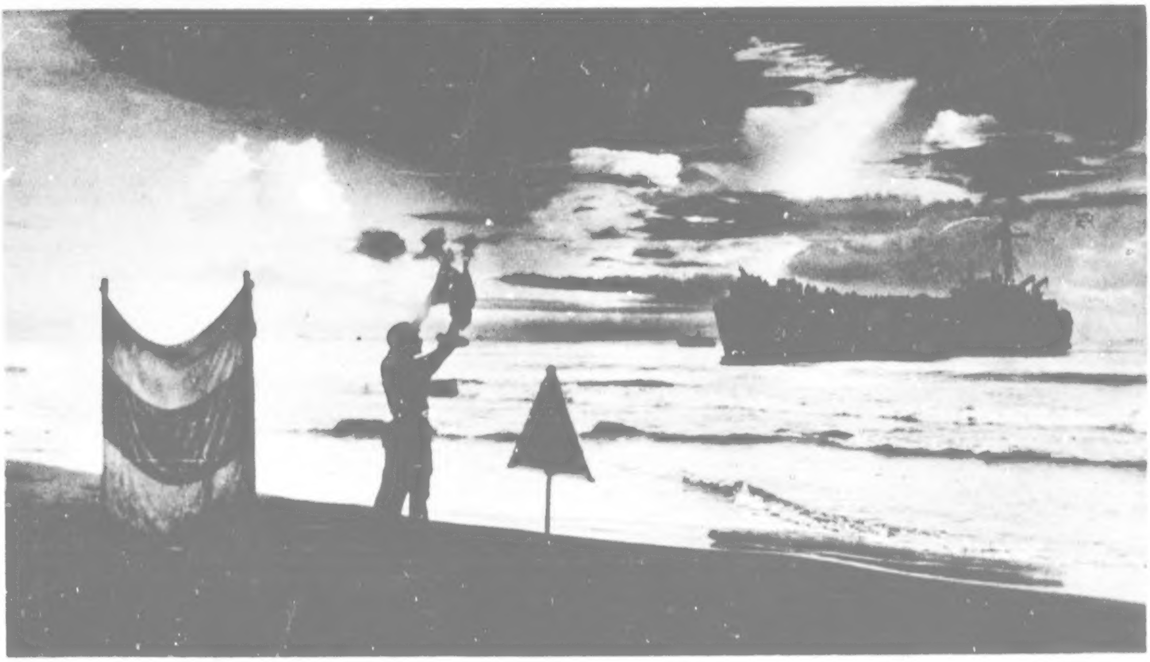
CHAPTER 9

SPECIAL SIGNALS

Special signals not contained in ATP 1(A), Vol. II are covered in this chapter. Knowledge of special amphibious signals, harbor tug control signals, replenishment fixtures, is a must for every Signalman. Every type of ship, from the mightiest carrier to the smallest personnel craft, is involved in modern amphibious operations. Any ship engaged in an extended operation at sea must depend on a supply ship for refueling, rearming, and provisions. During adverse weather conditions, or when trying to maneuver alongside a particularly restricted berth, even destroyer skippers find it necessary to have assistance of a harbor tug. It is in such situations as these where the wrong hand signal or sound signal between the tug and the bridge could cause considerable damage. It is easy to see why it is so essential for a leading Signalman to become proficient in these special signals. Chances are slim that he will even be assigned to a billet afloat where knowledge of these special signals is unnecessary.

AMPHIBIOUS SIGNALS

A special amphibious signal system for ship-to-shore movements uses panels, shapes, flags, and lights. (See fig. 9-1.) This system is not connected with any other system of signaling or



37.6

Figure 9-1.—Temporary ship-shore communications.

oceanographic markers. Flag signals should not be confused with any of those in ATP 1(A), Vol. II or Pub.102. Complete details of this system are contained in the effective edition of NWIP 22-3, *Ship-To-Shore Movement.*

CARGO IDENTIFICATION

Distinctive flags are flown by boats carrying various cargoes to enable control and beach party personnel to identify the types of cargo.

To further indicate the nature of the cargo carried in boats assigned to floating dumps, a numeral flag should be flown below the green flag to indicate type of cargo being carried.

A variety of standard identification flags and lights are shown in figure 9-2 which are used in the ship-to-shore movement.

LOAD DISPATCHING SIGNALS

To dispatch waves of boats the central control ship hoists the appropriate signals as shown in figure 9-3. Numeral flags are normally flown from both port and starboard yardarms. However, it is possible that waves on both sides will not be scheduled to land at the same time. In that case, the primary control ship hoists the appropriate signal on the yardarm on the side of the ship that the wave is scheduled to pass. Waves with two-digit numbers are dispatched by hoist using the numeral flag corresponding to the last digit of the wave number. All signals normally are paralleled by voice radio from the central control ship. All lights used are shielded and aimed at the approaching wave only.

BEACHING SIGNALS

The following visual signals are used by personnel on the beach to call in boats and amphibious vehicles for beaching.

1. Day – Yellow (Q) flag waved above the head.
2. Night – A flashlight with a lucite wand fitting waved in a vertical line.

To wave off boats and amphibious vehicles from beaching, the following visual signals are used.

1. Day – "Negative pennant" waved above the head.
2. Night – Two flashlights with lucite wand fittings waved in a horizontal line.

TYPE OF CARGO	DAY	NIGHT
Floating Dump Supplies	GREEN flag over numeral flag	Steady GREEN light over cargo color light(s), 2 feet apart
Rations	ONE flag	1 steady WHITE light
Medical Supplies	TWO flag	1 steady GREEN light
Flame Thrower Fuel	THREE flag	1 steady RED light
Water	FOUR flag	1 steady BLUE light
81mm Ammo	FIVE flag	1 steady AMBER light
105mm Ammo	SIX flag	2 steady AMBER lights
Bulk Cargo	RED flag	2 steady RED lights
Self-propelled Vehicles	BLUE flag	2 steady BLUE lights
Cargo Requiring Prime Mover	YELLOW flag	2 lights, steady BLUE over steady AMBER

37.43

Figure 9-2.–Cargo identification.

When not otherwise specified, flags flown from boats should be No. 6 signal flags or larger size. Special beach marking flags or panels, for which no dimensions are given, should approximate a No. 4 signal flag. These flags and panels should be made of cloth having a fluorescent characteristic for greater ease of identification under all weather conditions. Signal or marker lights should be of sufficient intensity to be visible at a distance of at least 1000 yards. Beach and unloading marker lights should be directional, 10-point lights trained to seaward.

Some beach markers, oceanographic markers, unloading point markers, and miscellaneous flags and identification insignia are shown in figures 9-4 through 9-11.

HARBOR TUG CONTROL SIGNALS

A Chief or First Class Signalman assigned to a ship as leading SM or to a harbor tug as skipper must know the proper harbor tug control signals. Aboard a ship, a Signalman may have to relay signals from the bridge to the tug alongside. As skipper of a tug, he must communicate with the ship he is assisting.

The following signals are used between U.S. Navy ships and tugs in U.S. ports. When a ship is preparing to enter a foreign port, be certain you know the harbor tug control signals used in that port are known.

WHISTLE SIGNALS

Whistle signals, administered by a hand whistle of the police type, appear in the accompanying list. Normally, whistle signals are augmented by hand signals.

From	*To*	*Blasts*
Stop	Half Speed Ahead	1
Half Speed Ahead	Stop	1
Half Speed Ahead	Full Speed Ahead	4 short
Full Speed Ahead	Half Speed Ahead	1
Stop	Half Speed Astern	2
Half Speed Astern	Full Speed Astern	4 short
Half (or Full) Speed Astern	Stop	1
Cast Off, Stand Clear	— —	1 prolonged, 2 short

WAVE	DEPARTURE TIME	DAY	NIGHT
WAVE ONE	5 minute standby	ONE flag at dip	Steady RED light for 30 seconds
	2 minute standby	ONE flag close-up	Flashing RED light for 30 seconds
	1 minute standby	---	Flashing RED light for 50 seconds then a 10-second steady RED light
	Departure time	ONE flag hauled down	Extinguish 10-second steady RED light to dispatch wave
WAVE TWO	2 minute standby	Numeral flag of wave close-up	Flashing BLUE light for 30 seconds
	1 minute standby	---	Flashing BLUE light for 50 seconds, then a 10-second steady BLUE light
	Departure time	Numeral flag hauled down	Extinguish 10-second steady BLUE light to dispatch wave
WAVE THREE	Same as Wave Two, except AMBER light is used.		
WAVE FOUR	Same as Wave Two, except GREEN light is used.		
WAVE FIVE	Same as Wave Two, except RED light is used.		
WAVE SIX	Same as Wave Two.		
Successive Waves	Continue using cycle outlined above.		

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Figure 9-3.—Departure time sequence.

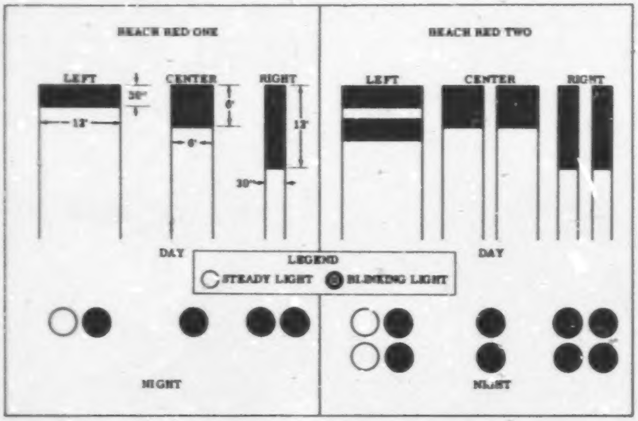

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Figure 9-4.–Beach markers from seaward.

A prolonged blast is 4 to 6 seconds in duration. A short blast is about 1 second in duration.

In using whistle signals to direct more than one tug, care must be exercised to ensure that the signal is directed to and received by the desired tug. Whistles with different and distinct tones have been used successfully to handle more than one tug.

Harbor tug control signals may be transmitted to the tug by flashing light. Flashing light signals, however, should be restricted to use only when hand whistle or hand signals cannot be used.

HAND SIGNALS

Proper hand signals are diagrammed in figure 9-12. Numbers identifying each signal correspond to the description that follows:

1. Half Speed Ahead (or Astern): Arm pointed in direction desired.

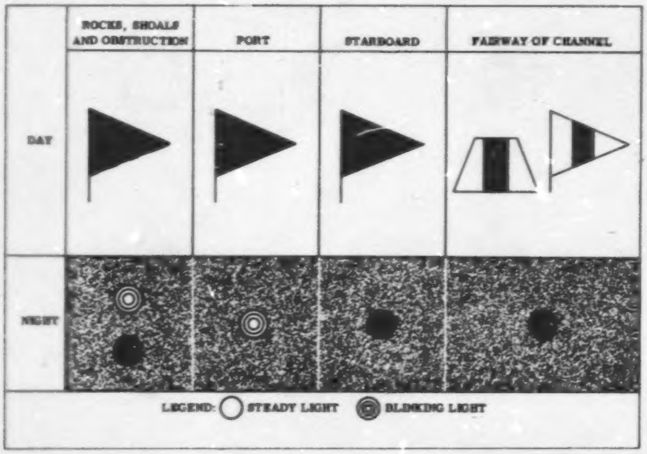

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Figure 9-5.–Oceanographic markers from seaward.

2. Tug to Use Right Rudder: Hand describing circle as if turning wheel to right (clockwise), facing in the same direction as tug.
3. Full Speed: Either first describing arc (as in "bouncing" an engine order telegraph).
4. Tug to Use Left Rudder: Hand describing circle as if turning wheel to left (counterclockwise), facing in same direction as tug.
5. Dead Slow: Undulating movement of either open hand (palm down).
6. Tug to Rudder Amidship: Arm at side of body, with hand extended swung back and forth.
7. Stop: Either open palm held aloft, facing tug.
8. Cast Off, Stand Clear: Closed fist with thumb extended, swung up and down.

A tug must acknowledge all hand signals with one short toot (1 second or less) from its

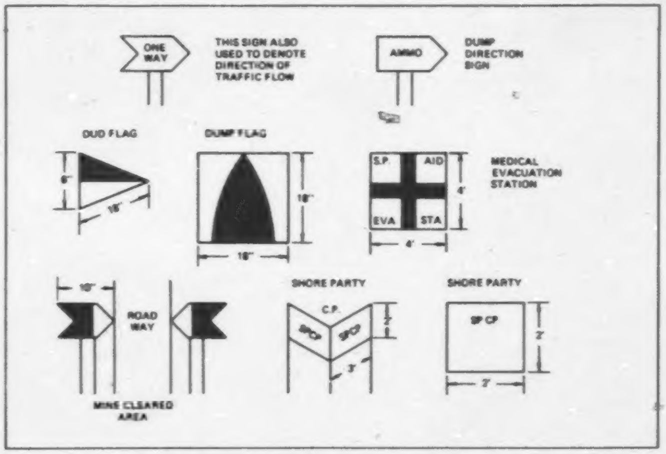

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Figure 9-6.—Miscellaneous beach signs.

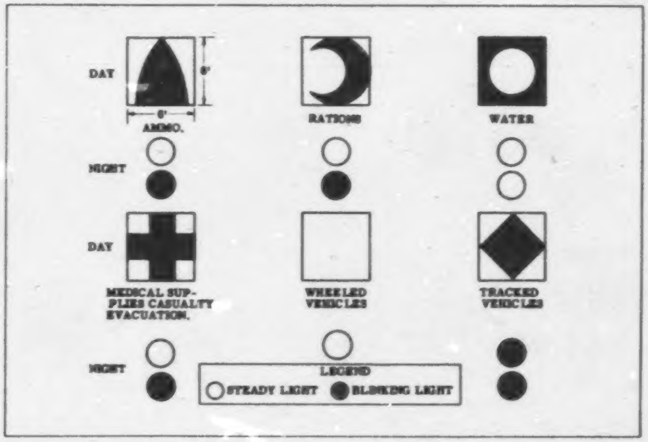

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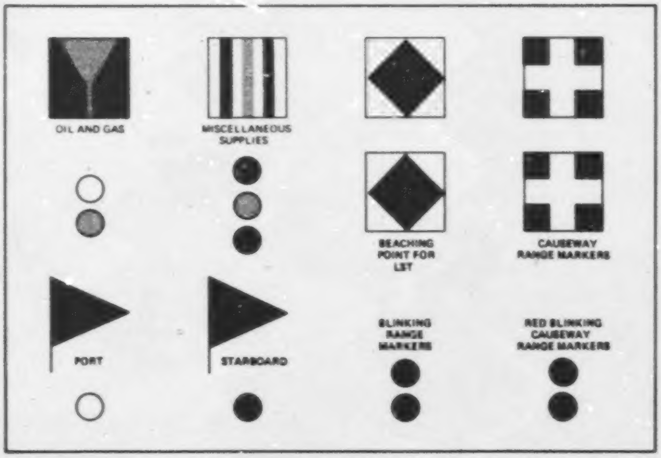
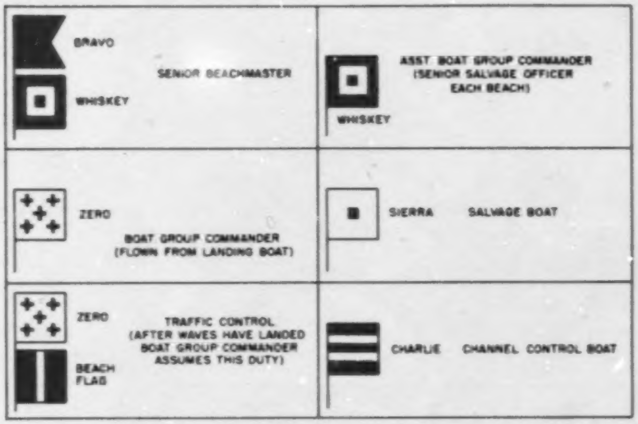
Figure 9-7.—Unloading point markers.



C37.46

Figure 9-8.–Unloading point markers–Continued.


BRAVO
WHISKEY
SENIOR BEACHMASTER
ASST BOAT GROUP COMMANDER (SENIOR SALVAGE OFFICER EACH BEACH)
WHISKEY
ZERO
BOAT GROUP COMMANDER (FLOWN FROM LANDING BOAT)
SIERRA
SALVAGE BOAT
ZERO
BEACH FLAG
TRAFFIC CONTROL (AFTER WAVES HAVE LANDED BOAT GROUP COMMANDER ASSUMES THIS DUTY)
CHARLIE
CHANNEL CONTROL BOAT

C37.30

Figure 9-9.–Miscellaneous flags and identification insignia.

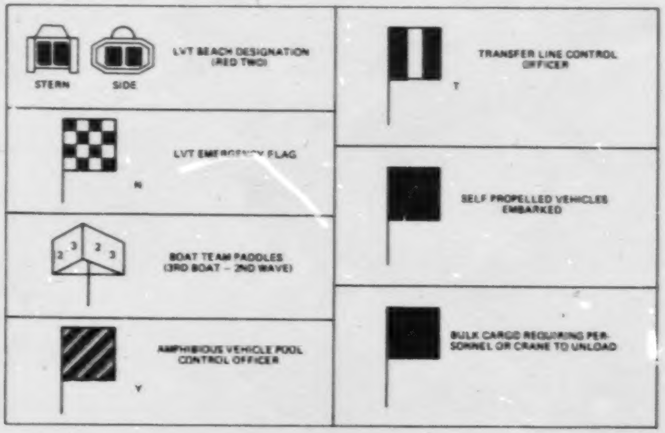
whistle. Exceptions are the backing signal, which must be acknowledged with two short toots, and the cast-off signal, which must be acknowledged by one prolonged and two short toots.

REPLENISHMENT COMMUNICATION EQUIPMENT

Signal bridge personnel, along with bridge watch, deck, and engineering personnel, participate in the overall operation of intership communications during replenishment at sea. These communications are effected by sound-powered telephone, hand signals, semaphore, megaphone, radio, flaghoist, and flashing light.

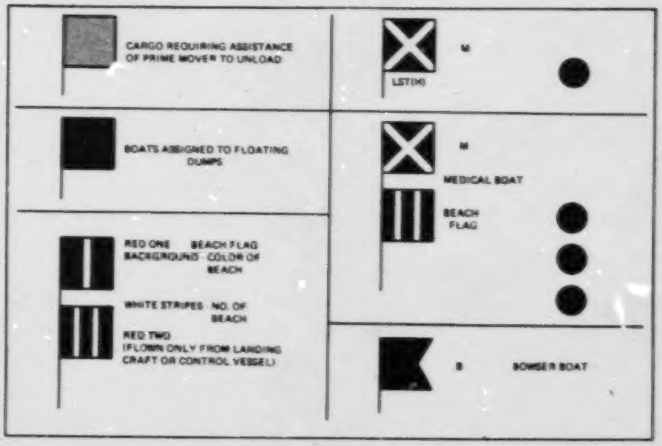
In accordance with International Rules of the Road, a vessel engaged in replenishment at sea, when from the nature of her work she is unable to get out of the way of approaching vessels, must carry, in lieu of a masthead and range light, three lights in a vertical line, one over the other so that the upper and lower lights are the same distance from and not less than 6 feet above or below, the middle light. The highest and lowest of these lights must be red, and the middle light white. By day, she must carry in a vertical line, one over the other, not less than 6 feet apart, where they can best be seen, three shapes, each not less than 2 feet in diameter, of which the highest and lowest must be globular in shape and red in color, and the middle one diamond in shape and white.

The main points of temporary replenishment communication facilities are outlined in figures 9-13 through 9-21. Additional details are found in the effective edition of NWP 38, *Replenishment at Sea.*


STERN
SIDE
LVT BEACH DESIGNATION (RED TWO)
2
3
2
3
LVT EMERGENCY FLAG
N
BOAT TEAM PADDLES (3RD BOAT – 2ND WAVE)
AMPHIBIOUS VEHICLE POOL CONTROL OFFICER
Y
TRANSFER LINE CONTROL OFFICER
T
SELF PROPELLED VEHICLES EMBARKED
BULK CARGO REQUIRING PERSONNEL OR CRANE TO UNLOAD

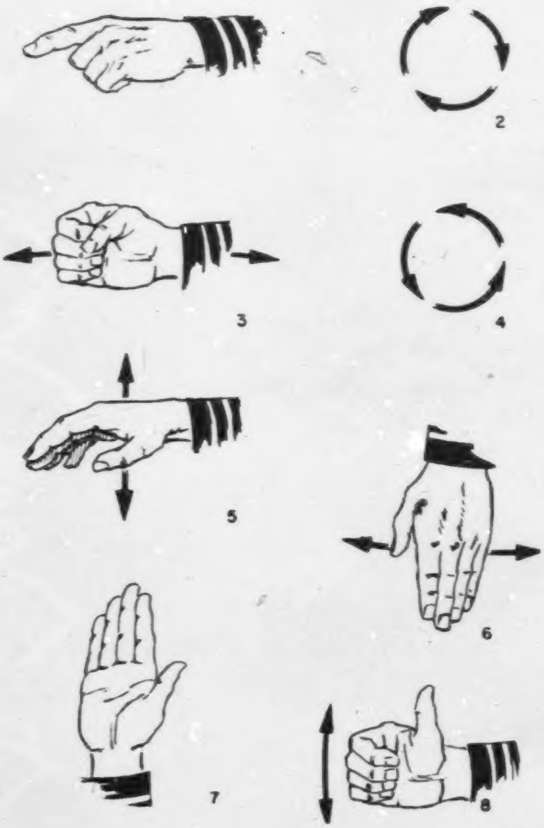
C37.47

Figure 9-10.–Miscellaneous flags and identification insignia–Continued


CARGO REQUIRING ASSISTANCE OF PRIME MOVER TO UNLOAD
BOATS ASSIGNED TO FLOATING DUMPS
RED ONE
BEACH FLAG
BACKGROUND - COLOR OF BEACH
WHITE STRIPES - NO. OF BEACH
RED TWO
(FLOWN ONLY FROM LANDING CRAFT OR CONTROL VESSEL)
M
LST(H)
M
MEDICAL BOAT
BEACH FLAG
B
BOWSER BOAT

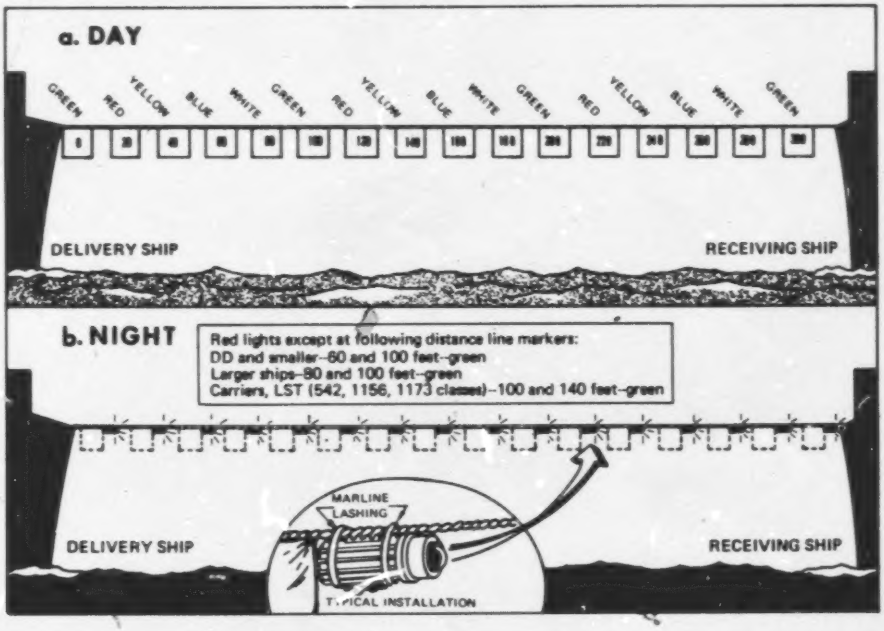
C37.48

Figure 9-11.–Miscellaneous flags and identification insignia–Continued.



37.7

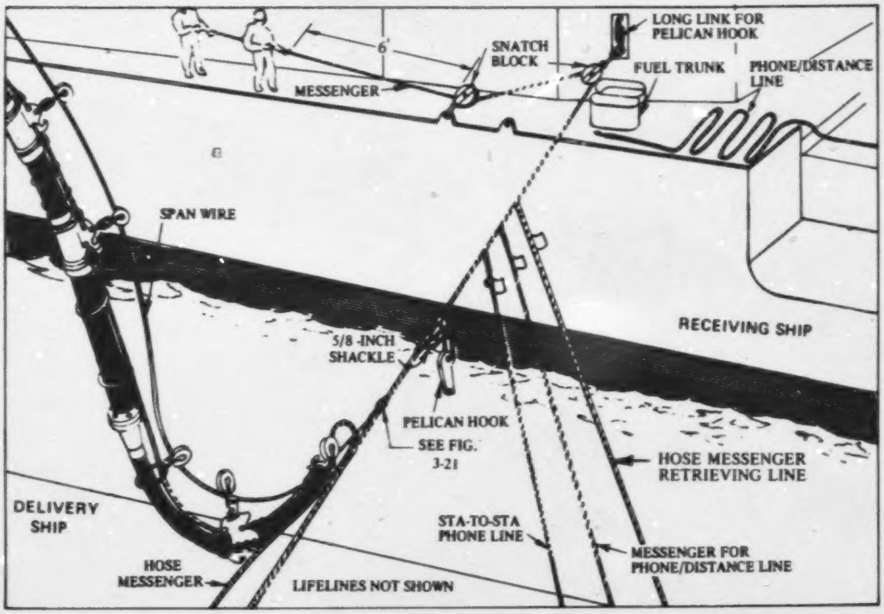
Figure 9-12.—Hand signals.



Red lights except at following distance line markers:
DD and smaller--60 and 100 feet--green
Larger ships--80 and 100 feet--green
Carriers, LST (542, 1156, 1173 classes)--100 and 140 feet--green

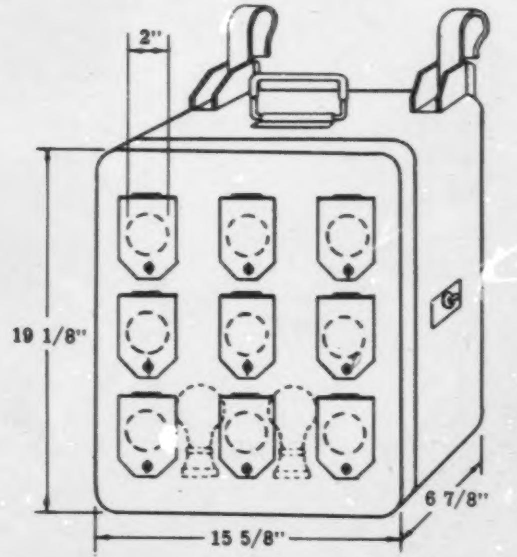
37.8(37C)

Figure 9-13.—Phone/distance line markings.



37.9(37C)

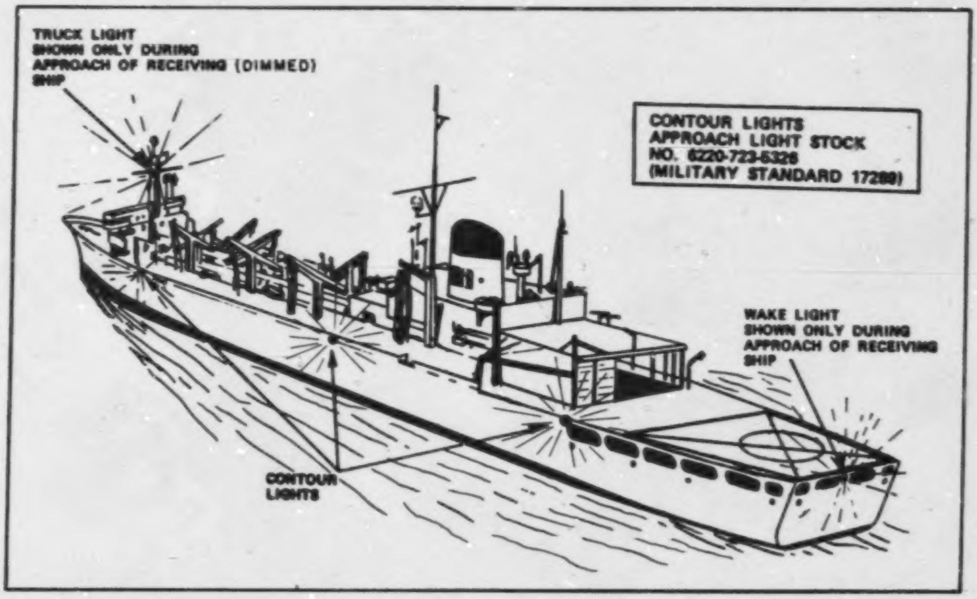
Figure 9-14.—Communication rigs.



Box has nine holes, each fitted with a red lens. Hand-operated individual shutters hinge upward. Illuminated by two 25-watt shielded bulbs (one is stand-by). Specifications given in FSN 6230-658-3045.

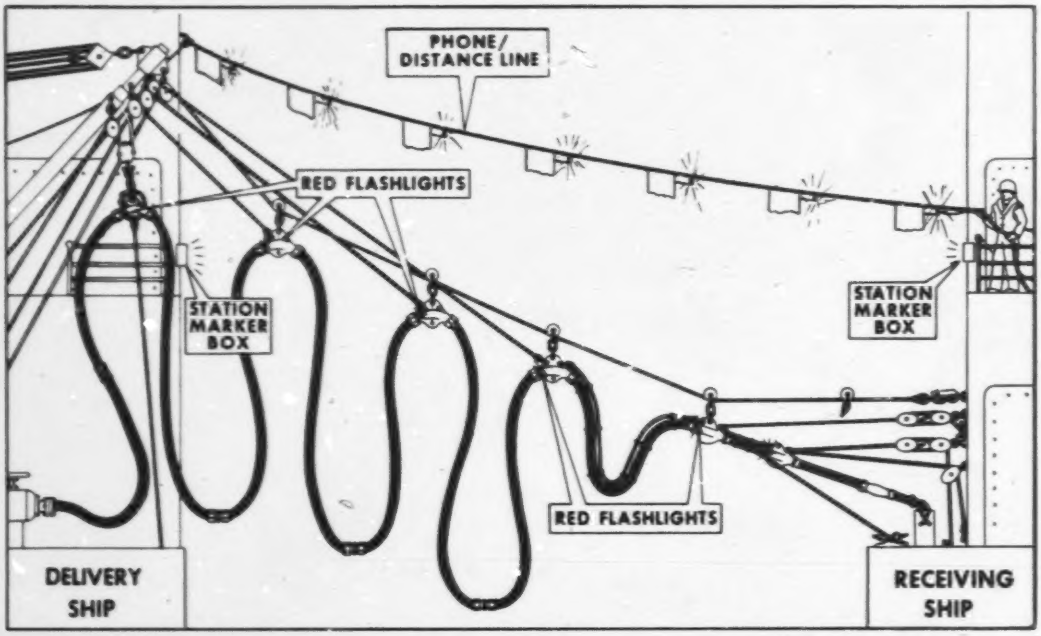
37.10

Figure 9-15.–Station marker box.



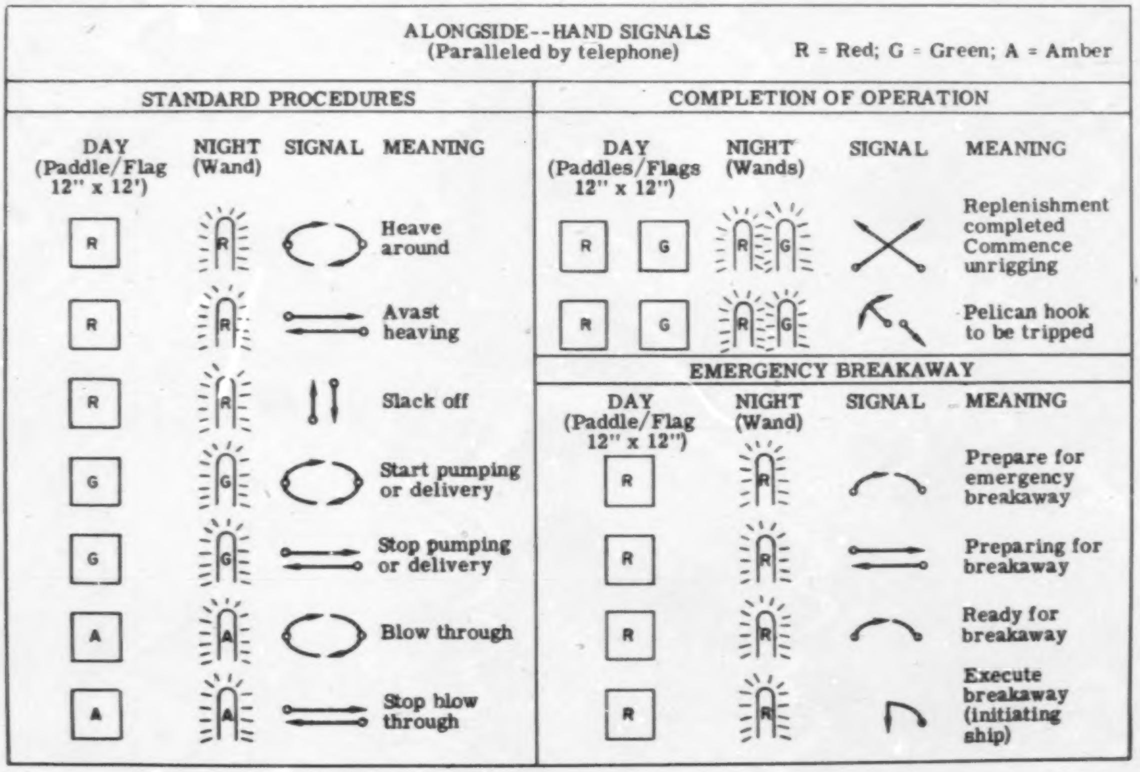
37.50

Figure 9-16.–Hull contour lights.



37.12(37C)

Figure 9-17.—Lighting for fuel oil transfer.



ALONGSIDE--HAND SIGNALS
(Paralleled by telephone)

R = Red; G = Green; A = Amber

STANDARD PROCEDURES

DAY (Paddle/Flag 12" x 12')	NIGHT (Wand)	SIGNAL	MEANING
R	R		Heave around
R	R		Avast heaving
R	R		Slack off
G	G		Start pumping or delivery
G	G		Stop pumping or delivery
A	A		Blow through
A	A		Stop blow through

COMPLETION OF OPERATION

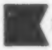
DAY (Paddles/Flags 12" x 12")	NIGHT (Wands)	SIGNAL	MEANING
R G	R G		Replenishment completed Commence unrigging
R G	R G		Pelican hook to be tripped

EMERGENCY BREAKAWAY

DAY (Paddle/Flag 12" x 12")	NIGHT (Wand)	SIGNAL	MEANING
R	R		Prepare for emergency breakaway
R	R		Preparing for breakaway
R	R		Ready for breakaway
R	R		Execute breakaway (initiating ship)

37.13.2A

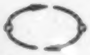
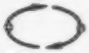
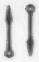
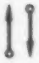
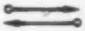
Figure 9-18.—Alongside hand signals.

SIGNAL	MEANING
	CONTROL SHIP
Romeo Displayed on fore yardarm on side rigged	At the dip: Am steady on course and speed and am preparing to receive you on side on which this flag is hoisted. Close up: Am steady for your approach. Hauled down: When messenger is in hand.
	APPROACH SHIP
Romeo Displayed on fore yardarm on side rigged	At the dip: Am ready to come alongside. Close up: Am commencing approach. Hauled down: When messenger is in hand.
Prep Displayed at the outboard yardarm	At the dip: Expect to disengage in 15 minutes. Close up: Replenishing completed; am disengaging at final station. Hauled down: All lines clear.
	BOTH SHIPS
	Where best seen: Fuel or explosives are being transferred.
	BY DELIVERING SHIP
 Bravo	At the dip: Have temporarily stopped supplying. Close up: Fuel or explosives are being transferred. Hauled down: Delivery is completed.
	BY RECEIVING SHIP
	At the dip: Have temporarily stopped receiving. Close up: Fuel or explosives are being transferred. Hauled down: Delivery is completed.

37.13.1(37C)

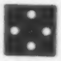
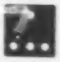
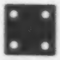
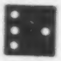
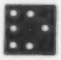
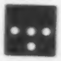
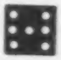
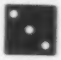
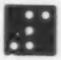
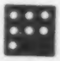
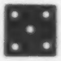
Figure 9-19.—Visual signals.

VERTICAL REPLENISHMENT
(Paralleled by radio) **R = Red; G = Green**

DAY *(Flag)	NIGHT (Wand)	SIGNAL	MEANING
G			Ready to receive Helo
Waved in overhead circle			
R			Not ready to receive Helo
Waved in overhead circle			
*Size 24" x 24". Stationary in replenishment area.			
Paddle/Flag 12" x 12"			
G			Lower load
Waved vertically in view of pilot			
R			Raise load
Waved vertically in view of pilot			
R			Execute emergency breakaway
Waved horizontally in view of pilot			

37.13.2B

Figure 9-20.—Vertical replenishment signals.

COMMODITY TRANSFERRED	CODE	
	DAY 3-FT. SQ. BUNTING OR PAINTED AREA	NIGHT STATION MARKER LIGHT BOX
Missiles	International Orange	
Ammunition	Green	
Fuel Oil	Red	
Diesel Oil	Blue	
Navy Distillate (ND)	Red-blue Triangles	
Avgas	Yellow	
Jet Fuel (JP-5)	Yellow-blue triangles	
Water	White	
Stores	Green with White Vertical Stripes	
Personnel and/or Light Freight	Green with White Letter "P" Centered	
Fuel oil and JP-5	Red, yellow, blue triangles	

37.14(37C)

Figure 9-21.–Station markers.

CHAPTER 10

OPERATIONS/COMMUNICATION DEPARTMENT

As a leading Signalman, you are required to know the organization and functions of all aspects of the department to which Signalmen are assigned. Aboard ship Signalmen usually are assigned to the operations department, unless the ship has a separate communication department, in which case Signalmen are assigned to that department. On rare occasions, Signalmen are assigned to the navigation department. (Inasmuch as that circumstance is so unusual, however, the navigation department is not taken up in this chapter.) A good understanding of the functions of a department as a whole can be gleaned if the duties and responsibilities of the departmental personnel are known.

DEPARTMENT HEAD

The department head is the representative of the commanding officer in all matters pertaining to his department. He confers directly with the commanding officer concerning any matters relating to his department when he believes such action to be necessary for the good of his department or the naval service.

GENERAL DUTIES

The department head keeps the commanding officer (and executive officer, when appropriate) informed of the general condition of all machinery and other installations of his department, giving special emphasis to any circumstance or condition that he believes may adversely affect the safety or operation of the command. The department head also advises the commanding officer concerning the need for and the progress of repairs, other than those of a minor nature.

SPECIFIC DUTIES

Some specific duties of a department head are:

1. Organize and train his department to ensure readiness for battle.
2. Prepare and maintain bills and orders for the organization and operation of the department.
3. Assign personnel to stations and duties within the department.
4. Be responsible for the effectiveness of the department. To this end, he must plan, direct, and supervise the work and training of assigned personnel.
5. Ensure that all prescribed and necessary security measures and safety precautions are strictly observed by all personnel within the department and by others who may be concerned with matters under his control. He must also ensure that all safety precautions are kept posted in conspicuous and accessible places, and that the personnel concerned are frequently and thoroughly instructed and drilled in their observance.
6. Make frequent inspections of the personnel and material of the department, including the spaces assigned thereto. and take necessary action to correct defects and deficiencies. Aboard ship, and at other commands if so directed by the commanding officer, the department head, or his representative, must inspect and report the condition of the department to the commanding officer each day. These inspections and reports normally are made between 1800 and 2000.
7. Control the expenditure of funds allotted, and operate the department within the limit of such funds.

8. Ensure economy in the use of public money.
9. Be responsible for the proper operation, care, preservation, and maintenance of the equipment and other material assigned to the department, and for the submission of such data in connection therewith including periodic inventories of assigned material, as may be prescribed by competent authority.
10. Be responsible for the maintenance of records and submission of reports required of the department.
11. Be the custodian of the keys to all spaces and storerooms of the department, except such storerooms as are assigned by regulation to the custody of another officer. He may designate and authorize subordinates within his department, as necessary, to have duplicates to such keys.
12. Be responsible for the cleanliness and upkeep of the spaces assigned to the department.
13. Anticipate the personnel and material needs of the department, and submit timely requests to fulfill requirements.
14. Contribute to the coordination of effort of the entire command by cooperation with other heads of departments.

Although the preceding list is long and somewhat tedious, and seems to impose quite a burden on heads of departments, you will see, as the operation and organization of the department are described, how some of these duties are delegated to others in the department.

OPERATIONS OFFICER

The head of the operations department is designated the operations officer. In addition to duties prescribed for all heads of departments, the operations officer is responsible, under the commanding officer, for the collection, evaluation, and dissemination of combat and operational information required for the assigned missions and tasks of the ship. Except when responsibilities are assigned to another officer, the operations officer is also liable for all other matters related to the operation of the ship and designated airborne aircraft. In general, an assistant is assigned to the operations officer to aid him in the performance of each of his duties.

ASSISTANTS TO OPERATIONS OFFICER

Aboard the smallest Navy ships, the operations officer may be the only commissioned officer in the department. When this situation exists, the operations officer performs all the duties that would normally be assigned to an assistant. The number of assistants varies with the size and mission of the ship. Aboard large ships, the assistants may include a combat information center officer, a meteorological officer, an electronics warfare officer, and (in ships that do not have a communication department) a communication officer.

Combat Information Center Officer

The combat information center (CIC) officer, when assigned, is responsible, under the operations officer, for the operation and maintenance of the combat information center and related spaces. Specifically he is responsible for the collection and dissemination of combat and operational information; the operation and care of radar and–in ships with no antisubmarine armament installed–underwater search equipment and electronic warfare equipment; the supervision and training of personnel assigned to him; control of airborne aircraft except when this control is assigned to other authority; and for the operation, care, and maintenance of sonar equipment used for search and torpedo detection purposes in ships that have no antisubmarine armament installed. Aboard smaller ships, the CIC officer may also be assigned as the division officer for the division to which Operations Specialists are assigned.

Meteorological Officer

The meteorological officer, when assigned, is responsible, under the operations officer, for providing information concerning present and anticipated weather conditions, sonar and radar propagation conditions, and sea and surf conditions. Specifically he is responsible for forecasting weather conditions for surface and air operations; taking and transmitting shipboard weather observations, as required; collecting and evaluating weather reports from other ships, aircraft, and stations; observing and forecasting conditions of sea and surf; collecting and evaluating strategic weather information; providing ballistic wind and density data; providing necessary information for evaluating effects of sea and atmospheric conditions on radar and sonar performance; maintaining required aerological records; and advising the navigator regarding the accuracy and completeness of the weather data required by him in fulfilling his assigned responsibilities. The meteorological officer may also serve as division officer of the division to which Aerographer's Mates are assigned.

Electronic Warfare Officer

When assigned, the electronic warfare officer, under the operations officer, is responsible for the organization, supervision, and coordination of electronic warfare, including detailed knowledge of electronic countermeasures and electronic counter-countermeasures. He is also responsible for the activity's capability to plan and execute such electronic warfare measures as may be ordered.

Specific duties of the electronic warfare officer include—

1. Supervising, training, qualifying, and assigning electronic warfare equipment operators, and training personnel connected with both active and passive electronic warfare operations.
2. Maintaining intraship and intraforce collection, evaluation, and dissemination facility for intercept information.
3. Maintaining an effective ship's passive intercept organization capable of executing duties as an electronic warfare guardship, search ship, direction-finder ship, or control ship within an assigned force.
4. Providing CIC and electronic warfare watches with a current electronic order of battle for friendly, potential nonfriendly, and enemy forces.
5. Providing coordination relative to intercept search as ordered by the OTC.
6. Advising and assisting the operations officer regarding proper counter-countermeasures, and deceptive electronic countermeasures means and techniques in use for communication countermeasures, navigational countermeasures, evasion, and deception.
7. Establishing a rapid and effective means for execution of an emission control plan within the ship.
8. The operation of all electronic warfare equipment not otherwise assigned.
9. Controlling the ship's electronic warfare operations during Readiness Condition I.

Communication Officer

In ships having no separate communication department, the communication officer is assigned to the operations department. In such cases, the communication officer is responsible, under the operations officer, for all external visual and electronic communications of the command. Specific duties of a communication officer are described in the section of this chapter concerning the communication officer as a department head.

Other Officers

Other officers may be assigned to the operations department as division officers or officers with various collateral duties. Frequently these officers are junior officers in training for one of the billets just described.

COMMUNICATION OFFICER

In ships that have a communication department, the head of that department is the communication officer. In addition to the duties prescribed for all department heads, the communication officer is responsible, under the commanding officer, for all visual and electronic exterior communications and for the administration of the internal systems pertaining thereto. A discussion of the principal assistants to the communication officer follows.

RADIO OFFICER

If a radio officer is assigned, he is responsible, under the communication officer, for electronic exterior communications and the administration of the internal systems pertaining thereto. This responsibility includes the operation and preventive maintenance of communication equipment assigned. The radio officer may have the additional duty of division officer of the division to which the Radiomen are assigned.

SIGNAL OFFICER

If a signal officer is assigned, he is responsible, under the communication officer, for visual exterior communications. Specific duties of the signal officer are described in detail in the chapter of this book entitled Assistant to the Signal Officer.

CSM CUSTODIAN

The Communications Security Material custodian is responsible for procurement, custody, correction, issue, physical security, disposition, and reporting of all CSM-distributed material.

CRYPTOSECURITY OFFICER

The cryptosecurity officer is responsible, under the communication officer, for secure and efficient cryptographic operations and the supervision and training of all crypto operators. In small ships, this billet may also be held by the CSM custodian.

DEPARTMENTAL ORGANIZATION

Unless the department is very small, the operations department or the communication department is usually organized into divisions. Each division is composed of the personnel of one rating or–if the ratings are closely related–the personnel of two or more ratings. Manning levels, and ship's missions determine the number and ratings of personnel assigned to the department.

ENLISTED PERSONNEL

Although the organizational structure varies from ship to ship, the ratings most frequently found in the operations or communication department are Aerographer's Mate, Air Controlman, Electronics Technician, Operations Specialist, Personnelman, Postal Clerk, Quartermaster, Radioman, Signalman, and Yeoman. Remember, however, that all of the ratings listed probably will not be found in the same department on any one ship, and ships having special missions probably will have ratings assigned that are not listed here.

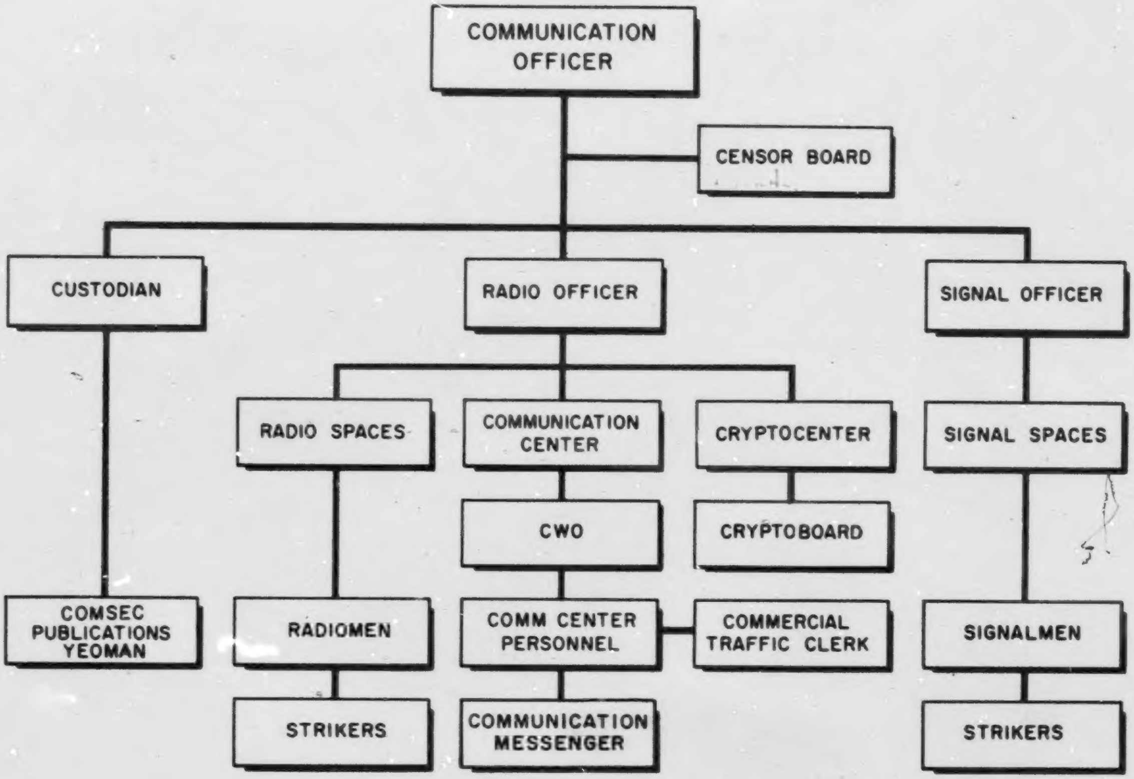
CHAIN OF COMMAND

Each division within a department has a leading chief (or leading petty officer if no chief is assigned) who heads the division at the working level. Each rating within the division also has a chief or leading PO. Inasmuch as divisions are subdivided into watch (or duty) sections, each watch section has a leading PO.

For informal matters, or matters concerned strictly with the operation or administration of one rating within a division, you as the leading Signalman, are authorized to confer directly with the division officer. For matters concerning the entire division and for formal requests and suggestions, the chain of command must be followed. This chain is from the section leader (or junior person making the request), through the leading PO in the rating, and the division chief (or leading PO), to the division officer. The division officer forwards matters that he does not resolve to the department head who forwards them, as necessary, to the executive officer and/or commanding officer (as appropriate). Most divisions also have procedures whereby any person may discuss purely personal matters with the division officer or department head without first divulging them to intermediate superiors. Figure 10-1 shows an organization chart of a shipboard communication department.

DEPARTMENTAL ADMINISTRATION

Regardless of size or mission, all shipboard departments are managed according to basic guidelines set forth in *Navy Regulations, Shipboard Procedures* (OPNAVINST 3120.32), type commander's directives, and the ship's organization and regulations manual. Some of the principles followed in departmental administration are discussed in ensuing topics. Particular emphasis is given to the operations department or communication department where appropriate.



76.4

Figure 10-1.—Shipboard communication organization.

SHIP'S ORGANIZATION AND REGULATIONS MANUAL

Each type commander promulgates a standard ship's organization and regulations manual. Individual commanding officers may develop their own manuals from the standard, or they may make necessary changes in the standard manual to adapt it for the particular ship's needs. The ship's organization and regulations manual gives the ship's administrative organization, watch organization, and bills, and contains guidelines for the assignment of departmental personnel to the stations for which the department is responsible.

Battle Organization Manual

The ship's battle organization manual is based on instructions contained in the effective edition of NWIP 50-1. The basic information in the manual is the same for all types of ships; however, the information must be adapted to individual ships. The order of arrangement of the battle organization manual should adhere as closely as possible to the following standard:

Chapter 1, Battle Organization, which contains information (as applicable) on command, ship control, operations control, primary flight control, weapons control, engineering control, damage control, mine countermeasures control, and debarkation control.

Chapter 2, Conditions of Readiness, which gives information on the material readiness of such items as ammunition, combat information facilities, damage control, engineering plant and spaces, aircraft, nuclear weapons, and mine countermeasures.

Chapter 3, Battle Bill, which outlines necessary considerations for the individual assignment of personnel to battle stations, gives summary of personnel requirements by number and station for various condition watches, lists the assignment of officers (by billet title) to battle stations and battle duties, and lists the battle stations to be manned by enlisted personnel and indicates, by billet number, the personnel to man each station.

Chapter 4, Interior Communications, which, as the title indicates, covers the ship's interior communications.

The battle organization manual is used, in conjunction with the ship's organization and regulations manual, to prepare department manuals and ship's bills. The battle organization manual, however, has an overall classification of Confidential, and for that reason cannot be bound and distributed with the ship's organization and regulations manual.

Department Organization Manual

Each department head is required to maintain a current organization manual. This manual provides the means by which the department head delegates authority to subordinates, and it supplements the ship's organization and regulations manual by giving detailed organizational descriptions.

Department organization manuals should contain only organization charts, functional guides, and assignment of basic responsibilities commensurate with the authority delegated to heads of departments, division officers, junior departmental officers, and key enlisted personnel. A sample table of contents for a manual for the operations department is shown in figure 10-2.

Ship's Bills

Ship's bills are designed to assign personnel to stations under several conditions. Administrative, operational, and emergency bills are included in the ship's organization and regulations manual. The battle bill is included in the battle organization manual.

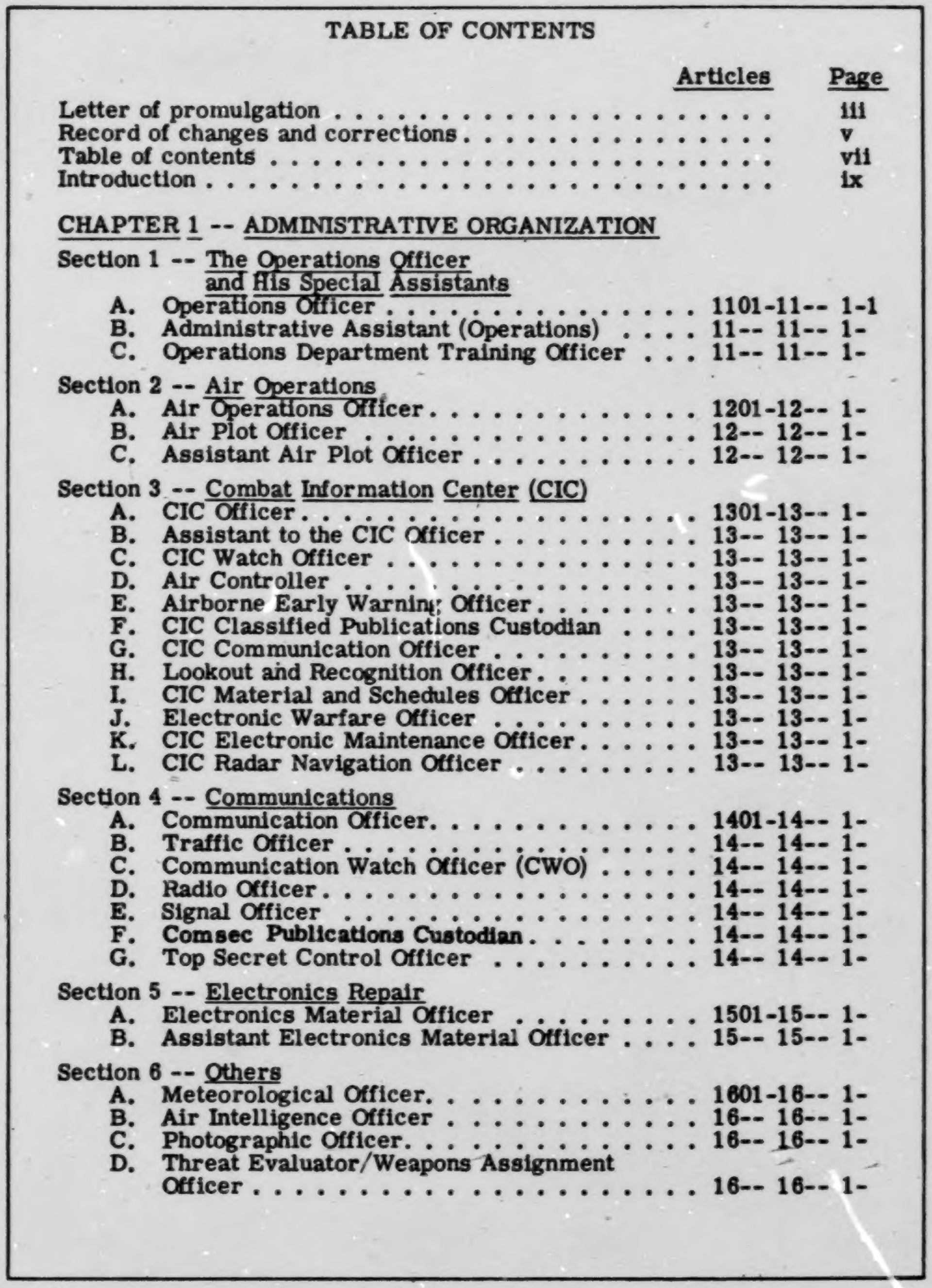
Various officers are assigned responsibility for maintenance of ship's bills. The operations officer normally is responsible for maintaining the visit and search, prize crew, and boarding and capture bills. He may also be responsible for maintaining other bills, depending on the nature and mission of the ship. Division officers usually assign newly reported personnel to the division watch, quarter, and station bill.

Maintenance of a ship's bills entails more than just assigning personnel and equipment to appropriate stations. Bills must be revised from time to time to ensure that assignments are up-to-date. Likewise, bills must be reviewed in the light of directives from higher authority and from the standpoint of changing equipment and procedures, which might necessitate changes in assignments.

RECORDS AND REPORTS

All departments are required by commanding officers, type commanders, and higher authorities to keep records and submit reports at varying intervals. Department heads usually are charged with overall responsibility for the records and reports of their departments; however, this responsibility frequently is delegated to departmental assistants, division officers, and other subordinates.

It is often impossible to remember all of the reports and records that must be submitted or retained. For example, communication reports alone include frequency activation and usage reports; reports of radio interference; fleet broadcast outage reports, encrypted traffic reports; reports of all class E messages involving tolls; reports of Government Navy (class A) messages involving tolls; reports of relief of commercial traffic clerk; and reports of irregularities in audit of commercial traffic funds. Because so many reports are required of a department, a systematic master tickler file of all reports required from the department should be maintained. The file should be uniform in makeup and should contain indicator separators marked as follows:



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E. Airborne Early Warning Officer	13-- 13--	1-
F. CIC Classified Publications Custodian	13-- 13--	1-
G. CIC Communication Officer	13-- 13--	1-
H. Lookout and Recognition Officer	13-- 13--	1-
I. CIC Material and Schedules Officer	13-- 13--	1-
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A. Communication Officer	1401-14--	1-
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C. Communication Watch Officer (CWO)	14-- 14--	1-
D. Radio Officer	14-- 14--	1-
E. Signal Officer	14-- 14--	1-
F. Comsec Publications Custodian	14-- 14--	1-
G. Top Secret Control Officer	14-- 14--	1-
Section 5 -- Electronics Repair		
A. Electronics Material Officer	1501-15--	1-
B. Assistant Electronics Material Officer	15-- 15--	1-
Section 6 -- Others		
A. Meteorological Officer	1601-16--	1-
B. Air Intelligence Officer	16-- 16--	1-
C. Photographic Officer	16-- 16--	1-
D. Threat Evaluator/Weapons Assignment Officer	16-- 16--	1-

37.39

Figure 10-2.—Table of contents for operations department manual.

DAILY
WEEKLY
MONTHLY
QUARTERLY
SEMIANNUALLY
ANNUALLY
AS OCCURRING
JANUARY through DECEMBER
1
2
3, etc, through the last day, for use during the current month.

No single publication lists all of the reports or records required of the operations or communication department. The requirements for records and reports can be learned only by a thorough knowledge of applicable bureau, type commander, and ship's instructions, and the various doctrinal publications used within the department.

DEPARTMENT INSPECTIONS

Both the material and personnel of a department must be inspected at frequent intervals. Much of the departmental equipment is inspected informally during its day-to-day operation. Personnel usually are inspected by the division officer at morning quarters to ensure maintenance of high standards of appearance. The department head may accompany one of his division officers each day on these inspections. As an alternative, the department head may muster all personnel in the department, at irregular intervals, and inspect them as a unit. In addition to the inspection of personnel, the spaces, equipment, and supplies of the department are inspected informally by division officers and/or department heads frequently.

More formal (scheduled) inspections are held by the commanding officer at his discretion. The commanding officer must ensure that consistent with their employment, personnel under his command present at all times a neat, clean, and seamanlike appearance. Aboard small ships, the CO may personally hold both personnel and material inspection on the same day. Aboard larger ships, these inspections normally require longer than 1 day's time for completion, and senior officers of the command may be assigned to inspect certain departments or zones.

ADMINISTRATIVE INSPECTIONS

One of the means by which senior commanders keep themselves informed of the condition of their ships is by conducting administrative inspections. Full-scale administrative inspections are held at intervals established by the type commander. Less comprehensive administrative inspections are held when a ship departs for or arrives at a place of deployment or when a ship reports for underway or shakedown training. Administrative inspections are conducted by officers from another ship or by officers from the staff of a senior commander. Petty officers normally are assigned to assist in the inspection.

When administrative inspections are scheduled, all hands prepare for the inspection by ensuring that equipment and records for the department are in order and that personnel are ready in every respect. Although the administration of the department may have been sound since the last administrative inspection, certain details must nevertheless be checked in preparation for the forthcoming inspection.

The department head makes a preliminary inspection of each division in his department at least 1 month before the scheduled date of the inspection. This preliminary inspection is as realistic and as detailed as possible, with everything prepared as it should be on the day of the inspection. All department personnel are made aware that certain types of discrepancies cannot be remedied instantly. For example, time may be required to order and obtain necessary publications, to make sure that all bills and instructions are posted as required, to ensure that files and records are complete and up-to-date, and to prepare departmental personnel so that they will be able to give prompt and accurate answers to any questions asked by the inspecting party.

Two major guides are helpful in getting the department ready for an administrative inspection. One is the administrative inspection checkoff list prepared by the type commander. The other is the record of the last administrative inspection. Checkoff lists are used by the inspecting party as a guide to the types of questions to ask and the types of discrepancies to note. Checkoff lists are only a guide, hence are not the only criterion the inspecting party uses.

Although administrative checkoff lists are prepared by type commanders and may therefore vary slightly in format or specific content, basically they are similar. All such checkoff lists contain numerous questions concerning the management and operation of a division or department, with appropriate spaces for the questions to be marked yes/satisfactory or no/unsatisfactory by the inspecting party.

An administrate inspection checkoff list usually is drafted to cover questions concerning an entire ship. Separate sections of the list are provided for each department. The section devoted to the operations department has subsections covering CIC, communications, registered publications, electronics, and (on small types) navigation. Ships having a communication department have subsections in the communication section of the checkoff list to cover the various divisions of that department.

During preparation for an administrative inspection, a check of the previous inspection report should be made to ensure that all discrepancies have been corrected. As soon as possible after the current inspection, newly discovered discrepancies must be corrected. If necessary, changes in procedure should be initiated to preclude recurrence of former discrepancies.

COMMUNICATION PLANNING

Planning plays a major role in any naval campaign. Before a campaign gets underway, plans must be made to cover any contingencies, including those of operations, logistics, intelligence, psychological warfare, and communications.

All operations in the Navy start from a general plan of the commander concerned. The commander notifies his subordinates of his plan by means of a directive. A directive is any communication that initiates or governs action, conduct, or procedure. In the most common usage of the term in military planning, it denotes the written instrument by which the plans of a commander are issued. A directive may be oral or written, however, and it may be transmitted by any means of communication. Usually a directive follows a standard form familiar to both originator and recipient. As a leading Signalman, and perhaps signal officer, you will be most concerned with the communication annex of two types of directives: operation orders and operation plans.

As a senior Signalman, you may or may not be concerned with the actual writing of directives, but it is imperative that you be able to use them effectively. You will have a definite part in planning and advising the communication officer regarding implementation of the communication annex of the directive at the shipboard level. Coverage of the directive is given in the remainder of this chapter, with emphasis on the communication annex. Because OpOrders and OpPlans resemble each other in format, only the former will be described in detail.

DIFFERENCE BETWEEN OPERATION PLANS AND OPERATION ORDERS

Operation orders (OpOrders) are issued for the purpose of effecting coordinated execution of an operation in the immediate or near future. They are prepared in accordance with a standard approved format, as set forth in NWP 11, *Naval Operational Planning*. Common understanding between individual services and, in larger aspect, between different Allied Nations is basic to successful combat. The approved format is designed to reduce to a minimum any areas of possible misunderstanding.

An operation order usually consists of a basic plan made of the heading, body, ending, and (as needed) detailed procedures (in the form of enclosures called annexes and appendices). The basic plan is kept concise, and contains only details necessary for a clear, overall picture of the operation. Annexes themselves may be brief or protracted. The often have appendices and tabs to elaborate on the many details to be considered in a large and complicated tactical operation.

Among subjects that properly may be discussed in annexes are battle plans, search and rescue, communications, intelligence, logistics, antiair warfare, and antisubmarine warfare. This list is not all-inclusive, however.

Amplifying information that is inappropriate for inclusion in the annex may be prepared as an appendix to the annex. In the same way, appendices may be amplified by preparing tabs to an appendix. Each appendix or tab is given a name descriptive of its contents. Appendices are listed at the end of the annex to which they belong. Tabs are listed at the end of their governing appendix.

An operation plan (OpPlan) is a directive for carrying out an operation or a series of operations extending over a large geographical area and usually covering a considerable period of time. Ordinarily an OpPlan is based upon, and therefore restricted by, various appropriate assumptions. It is prepared well in advance of an impending operation, and includes information concerning the time it will become effective. This information may be included in the plan, or the plan may state merely that it will become effective when signaled by appropriate authority. The OpPlan is the instrument upon which subordinate commanders base directives to their commands covering specific tasks assigned.

An operation order is prepared in a prescribed form, similar in most respects to an operation plan. It is issued by a commander to his subordinates to effect coordinated execution of a specific operation. It directs that the operation be carried out. No assumptions are included and, unless otherwise stated, the OpOrder is effective from the time and date signed.

Rarely in peacetime–and only infrequently in wartime–is the shipboard communicator called on to use an operation plan, although much of his daily routine in handling messages and circuits is part of the communication plan. On the other hand, almost all coordinated operations experienced in the daily life of a Navyman are carried out as the result of OpOrders.

HEADING

Figure 10-3 is a sample heading of an operation order. At the right, below the classification, is the title of the issuing headquarters. Omitted from the illustration is the copy number. A copy number would be required on each copy of the directive if the document were classified higher than Confidential. Each copy would bear a different number, and a record of disposition would have to be maintained.

The issuing headquarters title is preceded by titles of higher echelons considered necessary to ensure proper identification. The name of the flagship (or headquarters, if on shore) must be included as shown. The geographical location of the issuing commander is listed; or, if at sea, latitude and longitude. The date-time group of the signature, including zone description, appears next. Unless stated to the contrary in paragraph 3x of the order, the DTG is the effective time of the order. A message reference number is the originator's serial number for identification. This serial number is used for in-the-clear message acknowledgment of the order. A message reference number should contain no indication that it is associated with a plan or order.

Underlined words *Operation Order* appear to the left. This identifying title is sufficient when only one service takes part. If more than one service participates, such descriptive words as Joint Army-Navy Operation Order might be used.

Immediately below the directive designation is the short administrative title of the originator and the serial number of the directive. Each commander serializes his OpOrders consecutively throughout the calendar year.

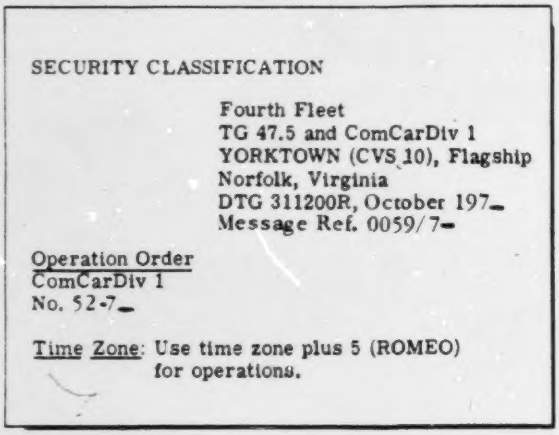
Pertinent references, if applicable, are listed next; for example, REFERENCES: NWP 20, NWP 116. None were necessary in the example, so none are shown. The time zone to be used in the operation is then included.

BODY

The body of the OpOrder consists of the task organization, five numbered paragraphs, and acknowledgment instructions. They are illustrated in figure 10-4.

In the task organization listing, each paragraph is lettered alphabetically beginning with the small letter a. Each subdivision of the commander's entire force to be assigned a task is listed separately with its designated task name (Heavy Unit, Screen Unit, etc.), followed by the name of the ship or administrative title of the officer in command of the force, group, unit, or task element.

Because an individual ship often is assigned several different tasks to perform during various



SECURITY CLASSIFICATION

Fourth Fleet
TG 47.5 and ComCarDiv 1
YORKTOWN (CVS 10), Flagship
Norfolk, Virginia
DTG 311200R, October 197_
Message Ref. 0059/7_

Operation Order
ComCarDiv 1
No. 52-7_

Time Zone: Use time zone plus 5 (ROMEO)
for operations.

50.2

Figure 10-3.—Operation order heading.

phases of an operation, it is common practice for a ship to be listed under several subheadings of the task organization.

Five Numbered Paragraphs

Paragraph 1 covers the situation. Here the commander sets forth only so much of the general situation as enables all his subordinates to understand the background of a planned operation. A history of preceding events is not desired. All information is brief and to the point. Paragraph 1 always contains three lettered subparagraphs (a, b, and c), none of which may be omitted or left blank.

Subparagraph a relates to enemy forces. In a wartime situation, this topic reflects the best intelligence estimate of what the enemy has available. If information is so extensive that is ineffective in this location, a separate annex may be written, and in the subparagraph a statement such as "See Annex___" is included. When no information is available (as in peacetime), a statement to this effect is made.

Subparagraph b concerns friendly forces. It refers only to friendly forces not listed in the task organization. Information on friendly forces is always brief and is restricted to data required for proper coordination of operations.

Subparagraph c is for listing attachments and detachments. Included here are any units that will join or be detached from the force as the operation progresses; if none, this information is so stated. If a "Schedule of Events" annex contains this information, reference to that annex is sufficient.

Paragraph 2 states the mission, which may have been assigned by higher authority or deduced from his instructions. In effect, paragraph 2 contains the most important information in the directive. Often it is the first item to be read by a subordinate upon receipt of the document. Paragraph 2 consists of the task to be accomplished and the purpose for accomplishing it, separated by the phrase "in order to." By reading the mission paragraph, each subordinate should be able to understand what is to be done and why. No other place in the operation order gives such a concise statement of the intent of the operation.

Paragraph 3 is the execution paragraph. Opening with "This force will," it sets forth, in concise terms, exactly what the overall organization is to accomplish.

In succeeding subparagraphs, beginning with letter a, tasks assigned to elements of the organization are prescribed in detail. Letters a, b, c, and so on, identify additional subparagraphs describing tasks assigned each unit of a force. An additional subparagraph, "Coordinating Instructions," identified by letter x, follows. Here are listed items of information to more than one task subdivision as well as instructions relating to security, cooperation, duration of events, and the like. If the directive is to become effective at some time or date other than the date-time group in the heading, this fact is stated in coordinating instructions.

Paragraph 4 is for administration and logistics. Necessary arrangements and procedures for accomplishing the mission are set forth in this paragraph. As in other paragraphs of the basic plan, it is permissible to refer to a logistics annex if one is appended. Or, as often happens in comparatively small local training operations, refer simply to existing instructions.

Paragraph 5 is the command and signal paragraph. As used here, signal means communications. Contained in this paragraph are all special features of command. These features include designation of the officer second in command, and also the location of the commander and his second in command. Addition-

Task Organization:

a. 47.5.2	Heavy Unit YORKTOWN (CVS 10)	RADM R. M. P. 1 CVS
	PLATTE (AO 24)	CAPT E. C. R. 1 AO
b. 47.5.3	Screen Unit DesDiv 152	CDR B. D. W. 4 DD
c. 47.5.4	Anti-Air Warfare, Coordination Unit DesDiv 153	CDR W. C. M. 4 DD

1. SITUATION. ComNavAirLant Notice 03360 of 16 February 197- scheduled an opposed ASW/AAW coordination sortie on 4 November with ComCarDiv 1 as OCE and OTC. This OpOrder covers the conduct of the sortie.

   a. Enemy Forces: None

   b. Friendly Forces: None

   c. Attachments and Detachments: None

2. MISSION. On 4 November 197- conduct a combined opposed ASW/AAW coordinated sortie exercise from Narragansett Bay in order to train assigned units in antisubmarine warfare and AAW coordination.

3. EXECUTION. This force will conduct a combined opposed ASW/AAW coordination sortie exercise from Narragansett Bay on 4 November 197-

   a. Heavy Unit - Sortie in accordance with Annexes A and D.

   b. ASW Screen Unit - Sortie in accordance with Annexes A and D, and protect heavy unit from submarine and air attack.

   c. Anti-Air Warfare Unit-Coordinate anti-air warfare of the sortie group in accordance with Annex G.

   x. Coordinating Instructions.

   (1) This operation order is effective for planning on receipt and for operations commencing 4 November 197-.

   (2) Search and rescue in accordance with CINCLANFLT OpOrder 1-65, NWP 37, NWIP 23-6, and Annex H. Submarine Search and Rescue Plan in accordance with COMSUBLANT OpPlan 27-65 (SUBMISS-SUBSUNK) and Annex H.

4. ADMINISTRATION and LOGISTICS. Administration and Logistics in accordance with existing instructions.

5. COMMAND and SIGNAL.

   a. Communications in accordance with Annex C.

   b. Use zone time plus 5 (ROMEO).

   c. Commander Carrier Division 1 in USS YORKTOWN (CVS 10) is OCE and OTC.

   d. Commander Destroyer Squadron FIFTEEN in USS PUTNAM second in command.

Acknowledgment Instructions:

Units listed in Task Organization acknowledge receipt of this directive by message using message reference number.

50.3-.5

Figure 10-4.—Task organization, numbered paragraphs, and acknowledgment instructions.

ally, division of responsibility among various commanders is clarified, and the communication plan is described or, customarily, the communication annex is referenced. A complete annex and one or more appendices are necessary—even for routine operations down to the division level of destroyer operations—because the problem of communications is so enormous and vital.

Acknowledgment instructions usually are included, but are not required. Acknowledgment means that the directive was received and is understood.

ENDING

The ending of the OpOrder includes the signature, list of annexes, distribution list, authentication, and security classification.

To make it effective, the directive requires the signature (fig. 10-5) of the commander. It appears below the acknowledgment instructions, to the right side of the page, over his rank and command title. For OpOrders and OpPlans concerning United States Navy units only, operational and administrative titles are added.

R. M. P.
RADM, U. S. Navy
Commander Task Group 47.5 and
Commander Carrier Division ONE

50.6

Figure 10-5.—The OpOrder signature.

The security classification appears on the top and bottom of each page of the directive. Below the signature are listed appended annexes (fig. 10-6), each designated by capital letters. Each appendix and tab to the various annexes are included in the list also.

A distribution list may be inserted after the list of annexes. For comparatively short distribution lists, each addressee is listed as part of the basic plan. For longer lists (this practice is usual in all but the simplest directives), the distribution list may be a separate annex, as in figure 10-7. The number of copies each addressee is to receive is indicated. If some addressees are to receive all but certain portions, the omitted part is so indicated. Administrative

SECURITY CLASSIFICATION

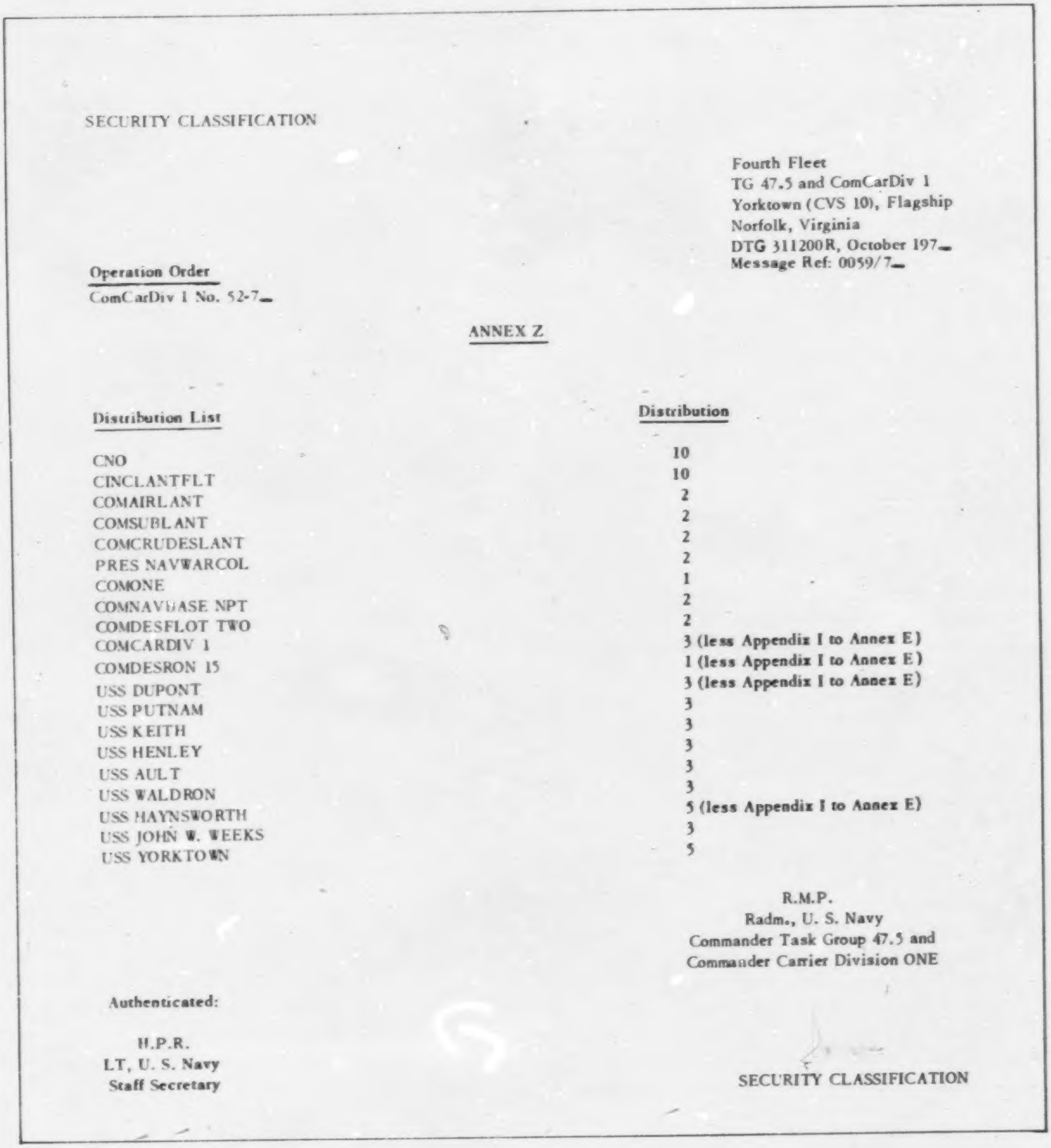
ANNEXES

A – Time Schedule
B – Navigation Instructions
C – Communications
  APPENDIX I – Frequency Plan
  APPENDIX II – Aircraft Communications
  APPENDIX III – Call Signs
  APPENDIX IV – ASW Circuits
D – Antisubmarine Warfare Plan
E – Air Strike Plan
  APPENDIX I – Strike Schedule
F – Friendly Air Schedule
G – Anti–Air Warfare Plan
  APPENDIX I – Picket, CAP, and Strike Control assignments
  APPENDIX II – AA Coordination Plan
H – Safety
R – Reports
Z – Distribution

SECURITY CLASSIFICATION

50.7

Figure 10-6.—Table of annexes.



SECURITY CLASSIFICATION

Fourth Fleet
TG 47.5 and ComCarDiv 1
Yorktown (CVS 10), Flagship
Norfolk, Virginia
DTG 311200R, October 197_
Message Ref: 0059/7_

Operation Order
ComCarDiv 1 No. 52-7_

ANNEX Z

Distribution List	Distribution
CNO	10
CINCLANTFLT	10
COMAIRLANT	2
COMSUBLANT	2
COMCRUDESLANT	2
PRES NAVWARCOL	2
COMONE	1
COMNAVBASE NPT	2
COMDESFLOT TWO	2
COMCARDIV 1	3 (less Appendix I to Annex E)
COMDESRON 15	1 (less Appendix I to Annex E)
USS DUPONT	3 (less Appendix I to Annex E)
USS PUTNAM	3
USS KEITH	3
USS HENLEY	3
USS AULT	3
USS WALDRON	3
USS HAYNSWORTH	5 (less Appendix I to Annex E)
USS JOHN W. WEEKS	3
USS YORKTOWN	5

R.M.P.
Radm., U. S. Navy
Commander Task Group 47.5 and
Commander Carrier Division ONE

Authenticated:

H.P.R.
LT, U. S. Navy
Staff Secretary

SECURITY CLASSIFICATION

50.8

Figure 10-7.—Distribution list as an annex.

titles are used in the distribution list, because tactical titles might serve to compromise the directive as well as cause mailing delays.

COMMUNICATION ANNEX

In addition to paragraph 5 of the basic directive, the most important portion of the OpOrder (for communication personnel) is the communication annex. Purpose of the communication annex is to give information on communications deemed too extensive to be included in the basic operation order.

To provide uniformity, each communication annex of an operation order for U.S. Navy operations must be prefaced by a standard paragraph that reads: "Communications in accordance with effective edition of NWP 16 and appropriate Joint, Allied, and Navy Department publications."

In some instances a directive may not include a communication annex. Reference then is made to existing ComOpPlan. When the directive does include a communication annex, however, the following information applies.

Customarily, the communication annex is designated Annex C (fig. 10-8). The numbering of paragraphs in the communication annex follows the numbering of related matters in NWP 16 that are to be amplified or modified.

In the communication annex for a combined operation, usually no reference is made to NWP 16 because not all Allied Nations have access to that publication.

The amount and type of information found in a communication annex depend on the purpose of the plan or order and on the mission of the command for which it is made.

Types of information that may be found in communication annexes are radio checks, call signs and address groups, frequency plans, distress communications, visual communications, authentication, and broadcast shifts. This list is not all-inclusive, however. Each of these headings is numbered according to the numbering of associated paragraphs in NWP 16.

Appendices

An appendix amplifies portions of annex material much the same as an annex amplifies a basic directive.

Figure 10-9 is an example of Appendix I (Call Sign List) to Annex C of the OpOrder presented in this chapter. The heading and ending are the same as the annex it appends.

Column 1 lists commands within the task group. Columns 2 and 3 give the international call sign and voice call sign, respectively. These three columns are the only ones necessary in the call sign list. In this example columns 4 and 5 are added to give further information. Column 4 shows call letters of the ship, occupied by various commanders. Column 5 lists the task group or task unit of which each command and ship is a part.

Any headings mentioned as being in the annex can be made into appendices if sufficient information warrants.

Tabs

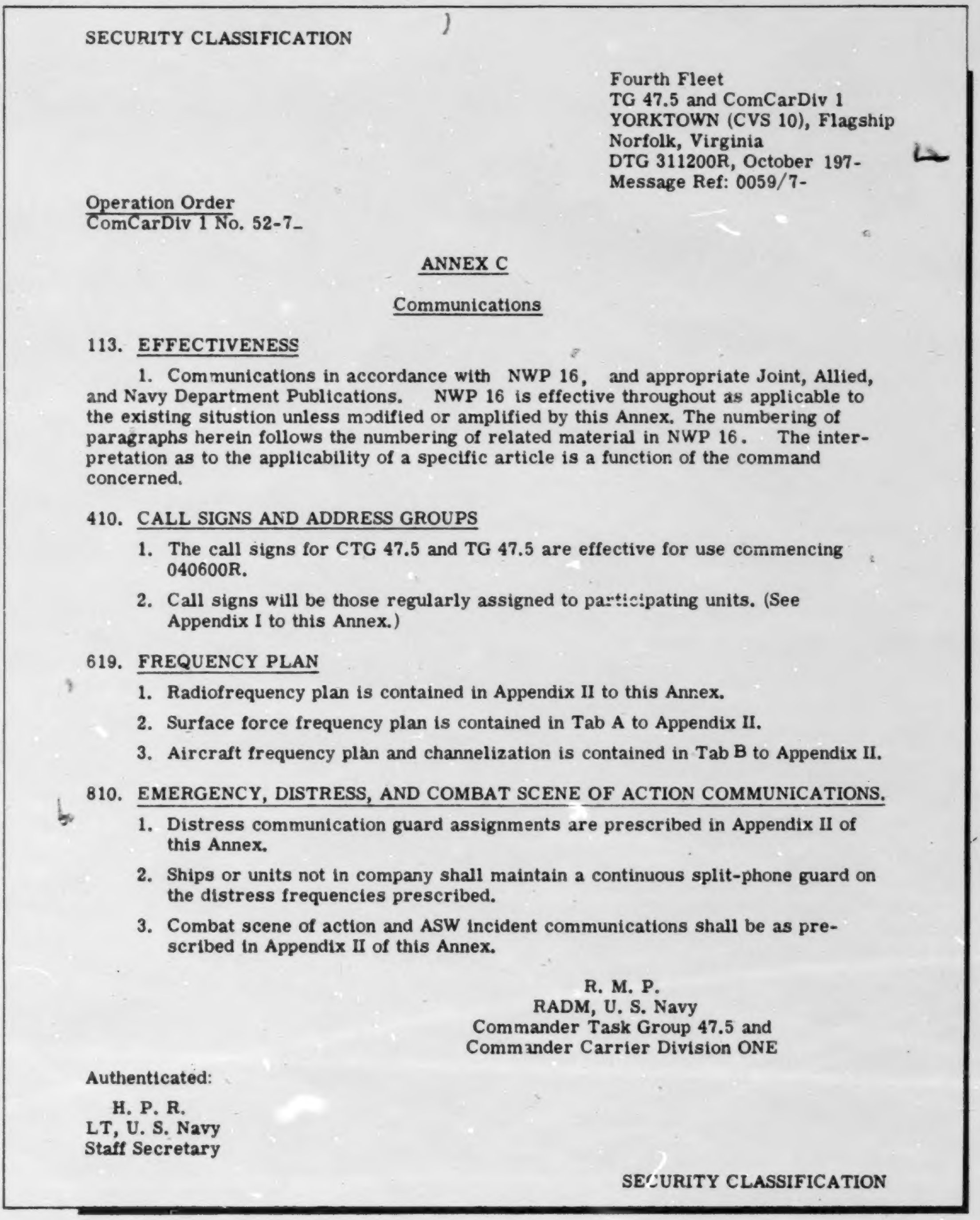
When necessary to amplify a portion of an appendix, a separate page is added as a tab. Appendix II (Frequency Plan), shown in figure 10-10 is broken down into tabs. Figure 10-11 is a condensed surface frequency plan designated Tab A. Possibly Tab B (not shown) could be the aircraft frequency and channelization plan.

Numbering

Annexes are designated serially by capital letters; appendices, serially by Roman numerals; and tabs, serially by capital letters. Thus, a tab might be referred to as Tab C to Appendix IV to Annex W. Pages of the basic directive are numbered serially starting with Arabic numeral 1; pages of annexes, serially by annex letter followed by page number, as C-2. Appendix pages are numbered by adding the Roman numeral in the appropriate place; for example, C-II-1 is page 1 of Appendix II to Annex C. Tabs add the capital letter, as appropriate, after the Roman numeral.

DISTRIBUTION OF COMMUNICATION ANNEX

The distribution list is contained in Annex Z of the directive. Although the communication plan is a supporting plan of the basic directive, it may be either bound with the basic directive or bound separately. In the latter instance, the communication annex may be, and frequently is, mailed separately, sometimes because of classification. It is also a common, desirable practice to provide additional copies of the communication annex. These extra copies make the information more widely available to the communication organization.



SECURITY CLASSIFICATION

Fourth Fleet
TG 47.5 and ComCarDiv 1
YORKTOWN (CVS 10), Flagship
Norfolk, Virginia
DTG 311200R, October 197-
Message Ref: 0059/7-

Operation Order
ComCarDiv 1 No. 52-7_

ANNEX C

Communications

113. EFFECTIVENESS

1. Communications in accordance with NWP 16, and appropriate Joint, Allied, and Navy Department Publications. NWP 16 is effective throughout as applicable to the existing situstion unless modified or amplified by this Annex. The numbering of paragraphs herein follows the numbering of related material in NWP 16. The interpretation as to the applicability of a specific article is a function of the command concerned.

410. CALL SIGNS AND ADDRESS GROUPS

1. The call signs for CTG 47.5 and TG 47.5 are effective for use commencing 040600R.
2. Call signs will be those regularly assigned to participating units. (See Appendix I to this Annex.)

619. FREQUENCY PLAN

1. Radiofrequency plan is contained in Appendix II to this Annex.
2. Surface force frequency plan is contained in Tab A to Appendix II.
3. Aircraft frequency plan and channelization is contained in Tab B to Appendix II.

810. EMERGENCY, DISTRESS, AND COMBAT SCENE OF ACTION COMMUNICATIONS.

1. Distress communication guard assignments are prescribed in Appendix II of this Annex.
2. Ships or units not in company shall maintain a continuous split-phone guard on the distress frequencies prescribed.
3. Combat scene of action and ASW incident communications shall be as prescribed in Appendix II of this Annex.

R. M. P.
RADM, U. S. Navy
Commander Task Group 47.5 and
Commander Carrier Division ONE

Authenticated:

H. P. R.
LT, U. S. Navy
Staff Secretary

SECURITY CLASSIFICATION

50.9

Figure 10-8.—Communication annex.

SECURITY CLASSIFICATION

Fourth Fleet
TG 47.5 and ComCarDiv 1
YORKTOWN (CVS 10), Flagship
Norfolk, Virginia
DTG 311200R, October 197-
Message ref: 0065/7-

Operation Order
ComCarDiv 1 No. 52-7_

APPENDIX I TO ANNEX C

CALL SIGN LIST

Command	Call Sign	Voice Call	Aboard	TG/TU
CTG 47.5	A5BC	JETSTREAM	NWKJ	
TG 47.5	C7FG	GLOBEMASTER		
CTU 47.5.2	B6DE	STARFIRE	NEJQ	
TU 47.5.2	D8HI	MOONGLOW		
CTU 47.5.3	E9JK	SUNFISH	NWKJ	
TU 47.5.3	F0LM	BLUESTAR		
CTU 47.5.4	G4NO	GREENSEA	NHXO	
TU 47.5.4	H3PQ	BROADSIDE		
COMCARDIV 1	XYAC	HIGHBROW	NWKJ	CTG 47.5
COMSERVRON 3	STCO	LIGHTSIDE	NEJQ	CTU 47.5.2
COMDESRON 15	DLHU	BEESTING	NHXO	CTU 47.5.4
COMDESDIV 152	XDBY	OVERBOARD	NHXO	TU 47.5.4
COMDESDIV 153	OSBR	CHANGEOVER	NTIR	TU 47.5.3
DUPONT (DD 941)	NTIR	PACEMAKER		TU 47.5.3
PUTNAM (DD 757)	NHXO	GOGETTER		TU 47.5.4
KEITH (DD 241)	NXDO	WANDERER		TU 47.5.3
HENLEY (DD 762)	NHXW	FASTENER		TU 47.5.3
AULT (DD 698)	NTWR	STICKPIN		TU 47.5.3
WALDRON (DD 699)	NTEX	FROGMAN		TU 47.5.4
HAYNSWORTH (DD 700)	NJTA	DRAGSTER		TU 47.5.4
JOHN W. WEEKS (DD 701)	NHEK	LOWBOY		TU 47.5.4
YORKTOWN (CVS 10)	NWKJ	HONEYCOMB		CTU 47.5.3
PLATTE (AO 24)	NEJQ	OILSLICK		TU 47.5.2

R. M. P.
RADM, U. S. Navy
Commander Task Group 47.5 and
Commander Carrier Division ONE

Authenticated:

H. P. R.
LT, U. S. Navy
Staff Secretary

SECURITY CLASSIFICATION

50.133

Figure 10-9.—Appendix 1 to annex Charlie—call sign list.

SECURITY CLASSIFICATION

Fourth Fleet
TG 47.5 and ComCarDiv 1
YORKTOWN (CVS 10), Flagship
Norfolk, Virginia
DTG 311200R, October 197-
Message Ref: 0065/7-

APPENDIX II TO ANNEX C

FREQUENCY PLAN

1. All frequencies in accordance with JANAP 195 and as assigned by ComFourthFlt.
2. Frequency shifts as necessary controlled by the circuit net control station.
3. Surface frequency plan is contained in Tab A to this Appendix.
4. Aircraft frequency plan and channelization is contained in Tab B to this Appendix.
5. Radio checks will be conducted at 020800R, 031500R, and 040700R on all circuits in consecutive order.

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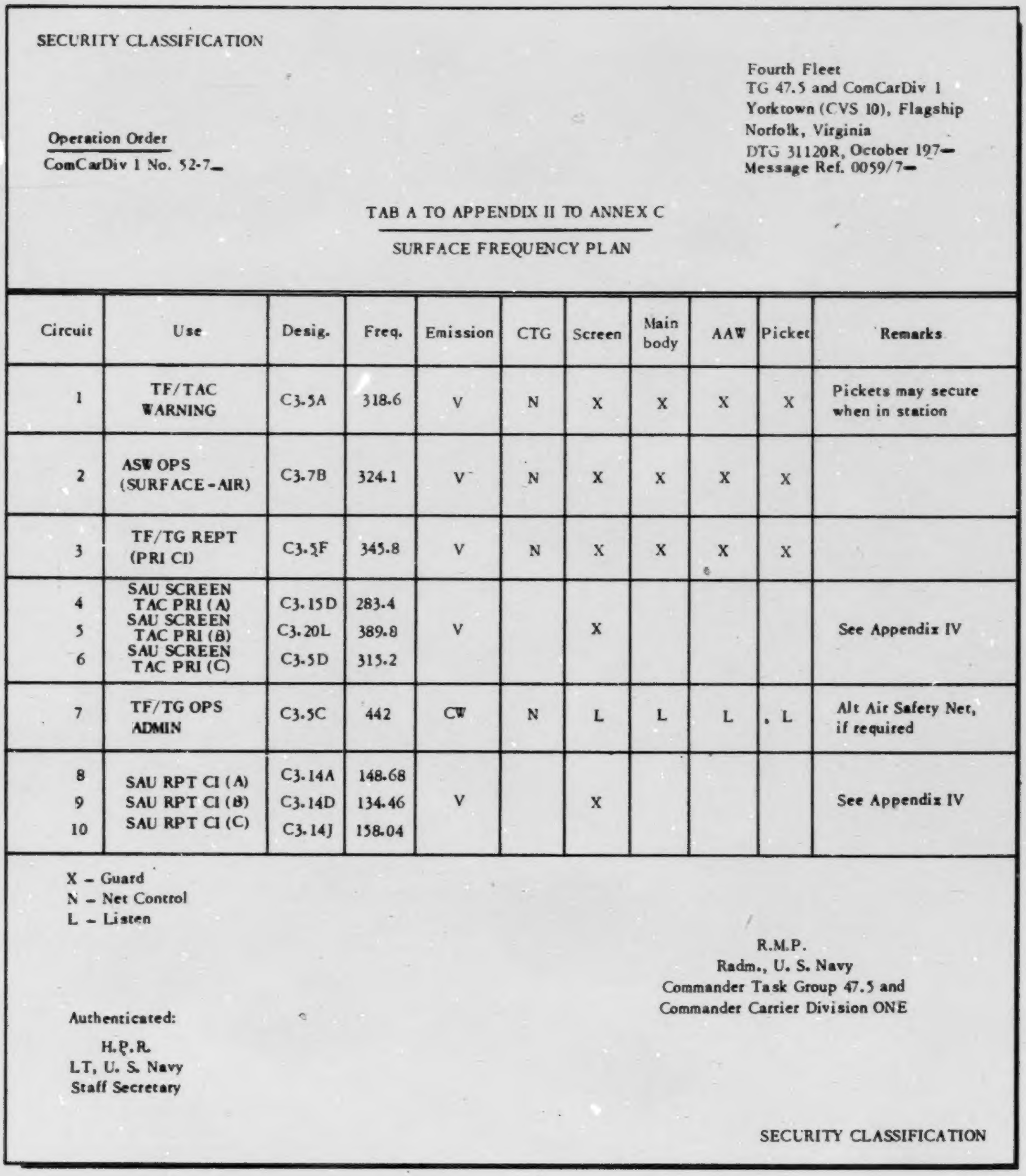
SECURITY CLASSIFICATION

50.134

Figure 10-10.—Appendix II to annex Charlie—frequency plan.



SECURITY CLASSIFICATION

Fourth Fleet
TG 47.5 and ComCarDiv 1
Yorktown (CVS 10), Flagship
Norfolk, Virginia
DTG 31120R, October 197—
Message Ref. 0059/7—

Operation Order
ComCarDiv 1 No. 52-7—

TAB A TO APPENDIX II TO ANNEX C

SURFACE FREQUENCY PLAN

Circuit	Use	Desig.	Freq.	Emission	CTG	Screen	Main body	AAW	Picket	Remarks
1	TF/TAC WARNING	C3.5A	318.6	V	N	X	X	X	X	Pickets may secure when in station
2	ASW OPS (SURFACE-AIR)	C3.7B	324.1	V	N	X	X	X	X	
3	TF/TG REPT (PRI CI)	C3.5F	345.8	V	N	X	X	X	X	
4	SAU SCREEN TAC PRI (A)	C3.15D	283.4	V		X				See Appendix IV
5	SAU SCREEN TAC PRI (B)	C3.20L	389.8							
6	SAU SCREEN TAC PRI (C)	C3.5D	315.2							
7	TF/TG OPS ADMIN	C3.5C	442	CW	N	L	L	L	L	Alt Air Safety Net, if required
8	SAU RPT CI (A)	C3.14A	148.68	V		X				See Appendix IV
9	SAU RPT CI (B)	C3.14D	134.46							
10	SAU RPT CI (C)	C3.14J	158.04							

X — Guard
N — Net Control
L — Listen

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SECURITY CLASSIFICATION

50.10

Figure 10-11.—Tab A to appendix II—frequency plan.

CHAPTER 11

ASSISTANT TO THE SIGNAL OFFICER

A Senior Signalman frequently is called upon to act as signal officer. Aboard small ships, this requirement often extends down to the first class petty officer level. Aboard intermediate-size ships, a commissioned officer of the operations department usually is assigned a collateral duty as signal officer. Aboard the largest ships, and especially on ships having a separate communication department, an officer is assigned to the primary duty of signal officer. One of the qualifications that must be met for personnel advancing to Master Chief Signalman is to serve as signal officer.

DUTIES OF SIGNAL OFFICER

The duties of signal officer are prescribed in detail in *U. S. Naval Communication Instructions and Procedures* (DNC 5). The signal officer is one of the assistants to the communication officer and is responsible under the communication officer, for visual exterior communications and the administration of the internal systems pertaining thereto, including the operation and preventive maintenance of communication equipment assigned.

In elaborating on the duties of the signal officer, DNC 5 makes the signal officer responsible to the communication officer for–

1. Providing information on visual signal requirements to the radio officer for inclusion in the ship's communication plan.
2. Coordinating with the radio officer in preparing the communication watch, quarter, and station bill.
3. Conducting a training program for visual signaling personnel, which covers professional subjects of their rating in coordination with the leadership and military training programs of the ship.
4. Preparing standard operating procedures for visual signaling, coordinating with the radio officer where required.
5. Monitoring the visual signaling effort to determine the adequacy of personnel allowances, billet assignments, operating procedures, and space and equipment configuration.
6. Coordinating with other officers of the ship, as authorized by the communication officer.

In practice, the responsibilities enumerated are not separated from each other as they appear in the listing, but occur as a continuing part of the signal officer's effort. Subsequent discussions will show how some of these responsibilities are carried out.

COMMUNICATION PROCEDURES

One of the principal responsibilities of the signal officer is to ensure that his personnel follow correct visual and radiotelephone operating procedures. As a senior Signalman, you have had experience in visual and voice communications as well as exposure to the publications containing doctrine and correct procedures. When acting as signal officer, you should bring to bear your experience and knowledge in observing and directing the activities of your men. When a signal officer is assigned–who is less familiar than you are with visual and voice communication–you should give him the benefit of your knowledge, encouraging and advising him in carrying out his responsibilities. Signaling is your profession; for the officer it is probably a temporary assignment.

Experience aside, the most efficient method for obtaining a complete overview of correct visual and radiotelephone procedures is conscientious study of the doctrinal, procedural, and operational publications pertaining to those two forms of communication. *Basic Operational Communication Doctrine,* NWP 16, establishes the basic doctrine, policies, and principles governing operational communications. *U.S. Naval Communication Instructions and Procedures,* DNC 5, supports and amplifies NWP 16, and is the principal directive for conducting U.S. naval communications. *Communications Instructions, Visual Signaling Procedure,* ACP 129, contains the instructions for visual signaling between allied ships. *Communication Instructions–Radiotelephone Procedure,* ACP 125, has instructions for communication by voice radio between allied ships. Other publications with which the signal officer must be familiar are given in the following list. Each of the publications includes instructions concerning its use.

- ACP 113, *Call Sign Book For Ships* contains a list of international call signs for ships under military control. This publication has both encode and decode sections for call signs of allied ships.
- ACP 121, *Communication Instructions–General* contains general information on communication matters of concern to all personnel.
- ACP 131, *Communication Instructions–Operating Signals* shows operating signals and instructions for their use by communication personnel in connection with traffic handling, or for sending concise messages by means of a simple, unchanging code.
- ACP 148, *Allied Guide To Masters (Visual Signaling and Tactics)* has information on visual signals (including call signs) and tactical maneuvers for merchant ships and naval vessels when underway in convoy operations.
- ACP 150, *Recognition and Identification Instructions–Air, Land, and Sea Forces* offers information on the correct usage of signals for challenge and reply as well as information pertaining to recognizing and identifying friendly (or hostile) forces.
- ACP 168, *Pyrotechnic Signals* describes the basic pyrotechnic signals, both color and smoke, for use by allied nations.
- ATP 1 (Vol. II), *Allied Naval Signal Book* contains standard maneuvering, operating, and the more common administrative signals.
- DNC 27, *Flags, Pennants, and Customs* contains information regarding the description and display of flags and pennants used in the naval service, description and uses of bow insignia and flagstaff ornaments, dimensions of signal flags and pennants, and other related material.
- PUB. 102, *International Code of Signals* gives international signals and procedures for use in any means of communication. Procedures and signals prescribed in this publication are used for communication between men-of-war and merchant ships.

The preceding list is, of course, not all-inclusive. Some of the listed publications are not unique to the signal bridge, but may be located in other communication and ship control stations. Additionally, publications not on the list may be needed and retained on the signal bridge, particularly aboard ships that engage in operations that require special signals.

OPERATING SIGNALS, PROSIGNS, PROWORDS, AND PUNCTUATION

As a ship's senior Signalman, and more particularly as acting signal officer, you are not expected to do any actual signaling. Your responsibility in this area is limited to observing personnel, supervising their actions, and correcting their mistakes. You will, however, probably be called upon to operate and monitor radiotelephone circuits. The most common mistakes made by operating personnel are the improper use of operating signals, prosigns, prowords, and punctuation. The following discussions apply to both visual and radiotelephone communication, unless specified otherwise.

Operating Signals

The use of operating signals (sometimes referred to as Q and Z signals) is discussed briefly in the Rate Training Manual, *Signalman 3&2.* As indicated in the preceding listing of publications, both operating signals and complete instructions for their use are given in ACP 131. Repetition of the information in those publications is unnecessary, but emphasis on several points is warranted in order to stress the correct usage of operating signals.

- Operating signals are not designed for radiotelephone transmission. In radiotelephone procedure, the information, order, or request contained in operating signals normally will be conveyed in concise phrases. When there are language difficulties, however–but not otherwise–operating signals may be used instead of standard radiotelephone phrases. In such instances, operating signals are transmitted by using the authorized phonetic equivalents.
- The Q signals may be used in both military and nonmilitary communications.
- The Z signals are designed to cover military communication requirements not adequately covered in the Q signal code.
- Signals in the QAA to QNZ series are assigned meanings by the International Civil Aviation Organization (ICAO). Normally, the only civil stations that will have a copy of this series are stations of the Aeronautical Service, therefore the QAA-QNZ series must not be used with other civil stations unless it is known that the station concerned is familiar with the series. (Stations of the Aeronautical Service are those stations operated in accordance with ICAO international standards and recommended practices to provide for the safety of air navigation and for the regular, efficient, and economical operation of air services.)
- Questions are asked of civil stations by adding the prosign $\overline{\text{IMI}}$ after the Q signal and any data used with it. Questions are asked of military stations by preceding the Q or Z signal with the prosign $\overline{\text{INT}}$.

Prosigns and Prowords

Procedure signs (prosigns) are one or more letters or characters or combinations thereof used to facilitate communication by conveying in a condensed standard form certain frequently used orders, instructions, requests, and information relating to communications. Improper or unauthorized use of prosigns seriously impairs secure, rapid, and accurate visual communications. Authorized visual prosigns and their correct usage are given in ACP 129. A few of the more common violations to be guarded against in the use of prosigns are given in the following list.

- Transmission of overscored letters as individual characters. (This procedure tends to confuse the receiving operator, because he may not be able to distinguish intended prosigns from other words or abbreviations.)
- Use of the unknown station call $\overline{\text{(AA)}}$ to contact stations whose call signs are known or can easily be determined.
- Use of $\overline{\text{AA}}$ by visual methods other than flashing light.
- Transmission of excessive number of Es to indicate an error.
- Use of the separative sign to attract the attention of a receiving station where either $\overline{\text{AA}}$ or a call sign is appropriate.
- Use of IMI to get repetitions of messages or portions thereof that have been receipted for.
- Use of prosign J in attempting to verify the accuracy of a transmission without authorization from the addressee.
- Failure to precede a call sign in the text of a message with the prosign PT.
- Use of WA and WB in requesting repetitions of a heading or portion of a heading. (Requests for repetitions of headings or parts thereof must be for all portions of the heading before a prosign, or all portions between two prosigns.)

Other errors occur in the use of prosigns, particularly among inexperienced personnel, but those listed arise most frequently and result in the most serious consequences.

Prowords (the radiotelephone equivalent of prosigns) are given, along with their correct usage, in ACP 125. Prowords are pronounceable words or phrases that have been assigned meanings for use in expediting message handling. Prowords should not be confused with operating signals which, as pointed out previously, are not normally used in radiotelephone communications; nor should they be confused with authorized abbreviations in DNC 5, or the operational brevity codes in ACP 165.

The most common error in the use of prowords is their substitution for the textual components of a message. This practice invariably causes delays, and results in reducing the reliability of radiotelephone transmissions.

Punctuation

Punctuation must be used in messages when its use is essential for clarity. The punctuation marks approved for use in U.S. Naval communications are limited to those listed in Article 5080b of DNC 5(B). Operating personnel normally learn punctuation marks as part of the Morse code or semaphore code.

Punctuation marks in messages must be processed and transmitted exactly as drafted, provided the means of communication permit. When the necessary punctuation mark is not available in the method of communication being used, operating personnel are authorized to spell the punctuation mark or abbreviate it. When spelled out or abbreviated, punctuation marks are counted in the message group count; when not spelled or abbreviated, the marks are not counted.

INTERNATIONAL CODE OF SIGNALS

The *International Code of Signals*, Pub. 102, provides ways and means of communication in situations related essentially to safety of navigation and persons, especially when language difficulties exist. The code can be used in visual and sound signaling. Where no language difficulties exist, it provides a simple and efficient method for communicating in plain language, using radiotelephone or radiotelegraph.

In the effective edition of Pub. 102, the code is very simple, consisting of 1-, 2-, and 3-letter signals. The publication is made up of 4 chapters, an appendix, and 2 indexes. Chapter 1 consists of signaling instructions; chapter 2 contains the general signal code; chapter 3 is the medical signal code; and chapter 4, the lifesaving signals and radiotelephone procedures.

The appendix to the code contains nationality identity signals for ships and aircraft. The first index is for use with the general signal code, and the second is for use with the medical signal code.

As leading Signalman or acting signal officer, you are familiar with international signaling procedures. Therefore, no attempt is made here to explain the entire code, but to alert you to areas in which problems may arise for operating personnel.

Because of its simplicity, difficulties in using the code should rarely occur. The most frequent problems for operating personnel arise when shifting from allied to international procedures. The procedures used by personnel inexperienced in international signaling should be monitored constantly. Some specific differences between allied and international procedure are pointed out in the following topics. Confusing the correct procedures of one method with the other must be guarded against.

Flaghoist

Only alphabet flags, numeral pennants, three substitutes, and the Code (Answering) pennant are used in international signaling. All numbers are represented by numeral pennants. Any attempt to use numeral flags in communication with merchant ships will only cause confusion because numeral flags do not exist in the international code.

Unlike allied procedure, where a substitute may take the place of any flag simply by counting down from the top of a hoist, a substitute in international procedure may replace only a flag of the same class as the flag immediately preceding that substitute. (Alphabet flags and numeral pennants are the two classes. The Answering pennant–when used as a decimal point–is disregarded in the count.)

Signals are answered by hoisting the answering pennant to the dip when a signal is first seen and close up when the signal is understood. Hoists should not be repeated flag for flag.

Procedure Signals

Procedure signals exist in international procedure that have no counterpart in allied procedure, and vice versa. Additionally, meanings conveyed by a procedure sign in allied procedure may be conveyed by a different procedure sign in international procedure. Some international procedure signs that have no counterpart in, or are different from, allied procedure are given in this topic. Again, use of improper procedure signs must be guarded against.

- BN means "All between...and..." and is used after the repeat signal.
- CS asks "What is the name or signal identity of your vessel (or station)?"
- NO means "The significance of the previous group should be read in the negative." In any voice transmission, this procedure sign is pronounced as "no".
- OK means "It is correct."
- RQ used after a signal is the equivalent of the allied $\overline{\text{INT}}$ and means "The significance of the previous group should be read as a question."
- RPT is the approximate equivalent of the allied $\overline{\text{IMI}}$ and means "I repeat," or "Repeat what you have sent," or "Repeat what you have received."

GENERAL EVOLUTIONS

When the division's watch, quarter, and station bill is up-to-date, and watch sections are arranged properly, the signal bridge will "run itself." An efficient supervisor in each section can handle routine occurrences on his watch, with an occasional suggestion or hint for improvement from you. During general evolutions, however, all Signalmen usually are assigned to stations on the signal bridge and, depending upon the number of Signalmen assigned, this group could be quite large. Personnel cannot be assigned to their normal underway watches because some stations would be manned by more than one person and other necessary stations would go unmanned. Inasmuch as your station during general evolutions is also on the signal bridge, it becomes your responsibility to assign personnel to stations and to use them in the most efficient manner.

The number of personnel assigned to the signal force is determined largely by watch requirements. On occasion, you may have more men than you think you need during a specific evolution, but more often you will have too few personnel. In either case, it behooves you to derive optimum use from the available personnel.

GENERAL QUARTERS

The most important evolution aboard any naval ship is general quarters. During general quarters all stations should be manned, and all personnel should remain vigilant until secured or until the word is passed to relax on stations.

As a minimum, the general quarters assignments should consist of the following personnel:

- Supervisor: The visual supervisor is the senior enlisted member of the general quarters team. As such, he is responsible for (1) supervising the other personnel assigned; (2) reporting directly to the CO/OOD on those events pertaining to evolutions, movements, sightings, unusual occurrences, and messages and signals relating to tactics or operations; (3) encoding and decoding visual signals; (4) maintaining the signal log; (5) directing the flow of visual traffic; and (6) acting as signal officer when none is assigned.
- Operators: The number of visual operators varies with the number of personnel assigned but there is always at least one. Visual operators perform the actual signaling for the ship. They transmit and receive messages by flashing light and semaphore, and may have the additional duty of operating the flag bags.
- Recorders: As incoming messages are received by the operators, recorders write them down on visual message blanks word-for-word or by individual characters if a coded message.
- Lookouts: All personnel not engaged in other signaling activities should have lookout duties. Certain personnel are assigned the primary responsibility of keeping lookout both for signals and events taking place in the vicinity. The lookouts may also be employed as spotters, using the ship's binoculars or telescope to watch the flagship for any signals that may be made.

The preceding list includes the minimum number of jobs that must be performed at general quarters but is not meant to imply the minimum number of personnel to perform the jobs. Aboard minesweepers (and other small ships) the entire signal force may consist of fewer than four men. In such instances, the obvious solution to the personnel problem is to assign one man to more than one job; for example, supervisor/operator, recorder/messenger/lookout.

Additional duties not mentioned in the preceding listing are, of course, performed on the signal bridge; and, in the usual situation, extra personnel are assigned who assist in performing the duties previously listed, and also perform the duties enumerated in the following list.

- Messenger: The messenger routes incoming messages to the commanding officer and the OOD, and–if it is the ship's policy–he delivers high-precedence messages directly to the persons concerned. Aboard ships that do not have pneumatic tubes or other mechanical devices for the physical internal transfer of messages, he also is required to deliver messages to the radio room (communication center) for writeup and internal routing.
- Telephone talkers: Depending on the ship's size and type, one or more of the following sound-powered telephone circuits might be manned on the signal bridge during general quarters: JA (captain's battle circuit), through which the commanding officer communicates with his department heads and their assistants; JF (flag officer's circuit), controlled by the embarked flag officer and used to exchange information of interest to the staff; JL (battle lookouts), connecting the lookouts, signal bridge, conning station, and CIC; and JX (radio and signals), through which the communication officer is connected to communication spaces.
- Logkeeper: Under heavy traffic handling conditions, a person may be assigned responsibility for keeping the visual log and message files. This assignment frees the supervisor from the logkeeping task so that he can devote his time to other supervisory duties.
- Flag bag operators: Personnel other than the signal operators may be assigned to conduct the flaghoist signaling. It is not considered good practice to have more than one person on each flag bag bend on signals for hoisting, but, for speed, two or more men can be used to stow flags that have been hauled down.

Where practicable, the jobs in the foregoing list should be rotated among the personnel to ensure a degree of experience and training in each phase of the visual communication general quarters operation.

SEA DETAILS

The sea detail organization is, for signal bridge personnel, similar to the general quarters organization. Assuming the same number of available personnel, the station assignments for special sea details should differ from the general quarters assignments as follows:

Only the JX (radio and signals) and 1JV (maneuvering and docking) sound-powered telephone circuits normally are manned. When entering or leaving port in column, one person should be assigned to watch the ship ahead and the ship astern for speed-indicating signals. The ensign at the gaff should be manned for returning dips from merchantmen. The task of determining seniority between own ship and other ships or commands should be assigned so that appropriate passing honors can be rendered. Finally, it may be necessary to station men on the stern and forecastle to hoist or lower the ensign and jack, respectively, upon anchoring or getting underway.

OTHER EVOLUTIONS

Various other evolutions require that the signal bridge be manned by personnel other than the normal steaming watch. These evolutions include visual tactical exercises, underway replenishment, and man overboard.

During tactics, emphasis is placed on spotting, operating the flag bags, communication with the conning officer, and logkeeping. During underway replenishment, fewer personnel are required to man signal stations, and some personnel may be spared for the replenishment working party. The remaining personnel concentrate on regular underway watch duties, with emphasis on communication with the ship(s) alongside. For man overboard, major emphasis is placed on lookout duties, i.e., finding and maintaining visual contact with the person in the water, communication with the conning station, and directing the movements of the lifeboat.

FLAG DUTY

With increasing frequency, Senior and Master Chief Signalmen are being assigned to duty with command staffs rather than to ships as ship's company. As a Master Chief Signalman you are required to know the organization, functions, principles of operation, management, and administration of a large Navy staff communication center. Before a specific discussion of the communication section, however, a general discussion of the Navy staff is in order.

NAVAL STAFF

A naval staff consists of the aids, heads of staff divisions, and other officers who command no forces but who are assigned to assist a commander in carrying out the functions of command. Functions of command may be analyzed as falling into six general areas: decision, administration, intelligence, operations and plans, logistics, and communications. These areas are the basis for the staff organization. The function of decision remains with the commander, the five other functions becoming the duties of major staff divisions. A typical Navy staff organization chart is shown in figure 11-1. Duties of the principal staff officers are discussed briefly in ensuing topics.

Chief of Staff

The chief of staff is the senior aide and principal assistant and advisor to the commander. He keeps the staff informed of the decisions and policies of the commander and is responsible for the preparation and promulgation of the necessary orders for their execution. He coordinates the work of the staff and prescribes policies and methods of operation. The chief of staff represents the commander during the commander's absence and at other times when authorized to do so.

Flag Secretary

In operational staffs the flag secretary usually serves both as aide to the commander and as assistant chief of staff for administration or administration officer. In his capacity as aide, he reports directly to the commander. In performing his duties as flag secretary, he reports to the head of the administration division (when he is not head of that division).

Flag Lieutenant

Like the flag secretary, the flag lieutenant has dual responsibility. Primarily he is personal aide to the commander, with responsibility for the proper rendering of honors and salutes, conducting official ceremonies, and keeping the chief of staff informed regarding the movements of the commander. The flag lieutenant has additional duties as flag signal officer and flag division officer. In these capacities he is responsible for visual signaling and for supervision of enlisted personnel of the flag division. In performing these duties he reports through the normal chain of staff authority.

Assistant Chief of Staff for Administration

The assistant chief of staff for administration heads the administration division (N-1), and is responsible for the personnel and work of the division. On operational staffs, the flag secretary normally is head of the administration division. The administration division has responsibility for developing personnel policies within the command. Other personnel responsibilities include accounting, procurement, assignment, promotion, discharge, replacement of personnel, and recording and forwarding casualty reports.

Assistant Chief of Staff for Intelligence

The assistant chief of staff for intelligence heads the intelligence division (N-2) and is responsible for collection, production, and dissemination of intelligence. He is also responsible for supplying the intelligence and security guidance required by the command and immediately subordinate echelons in the chain of command.

Assistant Chief of Staff for Operations and Plans

The assistant chief of staff for operations and plans is responsible for the personnel and work of the operations and plans division (N-3). (In operational commands the head of this division usually is the officer next in seniority to the chief of staff, and he should be prepared to relieve that officer if necessary.) This division, which has staff cognizance over all matters relating to readiness and training, is organized in two sections: operations and plans. Operations is responsible, in the name of the commander, for assigning the tasks and supervising the employment of units under the command. Plans is responsible for current and future plans in coordination with other staff divisions and other commands.

Assistant Chief of Staff for Logistics

The assistant chief of staff for logistics heads the logistics division (N-4) and is responsible for the personnel assigned to, and the proper functioning of, that division. The major elements of logistics are determination of requirements, procurement and maintenance, and distribution. Other facets of logistics are shown in figure 11-1 and are not elaborated on here.

Assistant Chief of Staff for Communications

The assistant chief of staff for communications heads the communication division (N-5) and is responsible for the work and personnel of that division. The overall mission of the division is to provide adequate rapid communications within the command and with other commands. The division has responsibility for custody and supervision of publications distributed through the Registered Publications Section, and for communication equipment, security, discipline, and intelligence. The communication division may also operate a staff message center and cryptocenter.

Enlisted Personnel

Enlisted personnel (called the flag allowance) are assigned to duties with staffs much the same as they are assigned to ships. The size and mission of the staff are the determining factor in the number and ratings of enlisted personnel assigned. The smallest flag allowance may include only a Radioman and a Steward, whereas the largest could include nearly every rating found aboard ship. As leading Signalman–whether ashore or aboard ship–your relationship to staff officers and flag enlisted personnel is equivalent to your relationship to the officers and crew of a ship when you are ship's company.

When the staff moves aboard ship, staff enlisted personnel are attached to the flag division. They are assigned to the ship for administration and discipline. The flag division officer, with approval of the chief of staff, assigns their duties, watches, and battle stations; regulates their leave and liberty; and ensures that they carry out the flagship's administrative routine. The duties of leading chief or leading petty officer could devolve on you, with all the responsibilities of the senior enlisted person in any division. Whether senior enlisted man or not, your principal concern will be with communications.

COMMUNICATION SECTION

Except for matters of general discipline, in which they are subject to the internal regulations and routine of the ship, staff officers have no administrative connection with the flagship.

By common practice, commanders refrain from interfering with the internal administration of flagships, and deal with flagships as they would any other ship of their command. Efficient operation requires consolidation of staff and flagship communication operational personnel, however. The staff communication officer assumes direct authority over this team, prescribing watches, message-handling procedures, and other details to maintain effective communications. The communication organization and files of the flagship must remain intact so that, when the embarked staff disembarks, the ship's communication organization can resume normal operations.

A shore-based staff with a small traffic volume and no special terminal requirements may receive communication support from the message center of another conveniently located

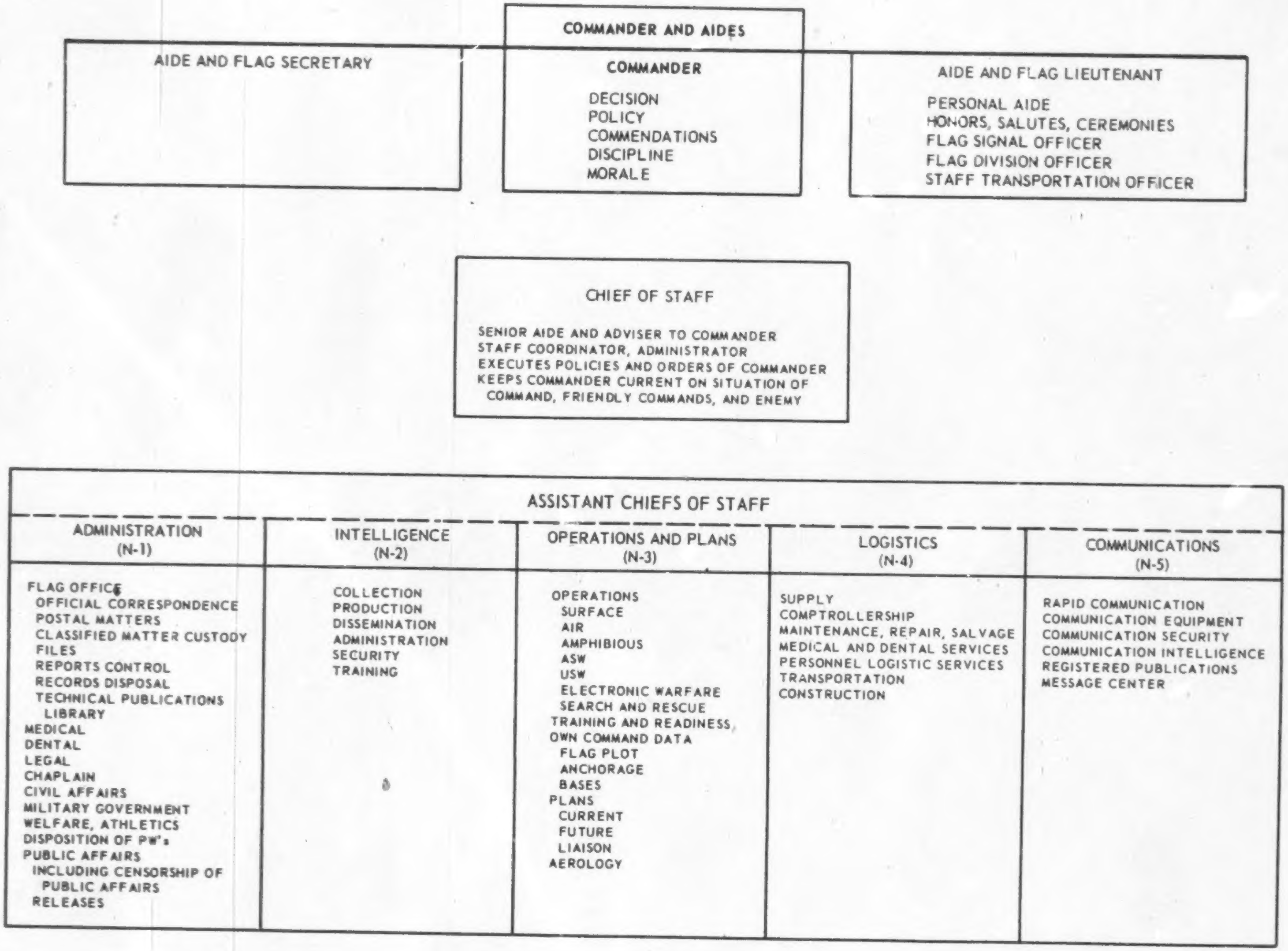


Figure 11-1.—Typical Navy staff organization.

organization without having to establish and maintain its own communication center. On the other hand, a large staff with a heavy traffic load may require a separate communication center with a wide assortment of facilities such as Autodin, Autovon, weather nets, and operating positions for direct control of ship/shore and air/ground circuits.

FUNCTION; ORGANIZATION; MANAGEMENT

The function of the staff communication section is to provide a "voice" for the command. The organization of the communication section is dictated by its size and mission. Management is prescribed by doctrinal publications, directives of higher authorities, and the assistant chief of staff for communications.

By their nature, the functions performed by the communication section require direct access to the commander and chief of staff. A system must be devised whereby the commander is kept informed of the status of communications to and from the command. Outgoing messages are prepared by cognizant staff officers who are responsible for determining the necessity for the message; designating the proper security classification; assigning the correct precedence; listing the addressees; coordinating with other interested officers; obtaining release; and delivering the message to the communication watch officer.

Outgoing messages must be released prior to transmission. Normally, the commander or chief of staff will personally release outgoing messages except as follows:

1. Heads of divisions are authorized to release messages "by direction" when the subject matter is under their cognizance and within the framework of policies and schedules approved by the commander.
2. In emergencies, when the commander, chief of staff, or division head is not available, the staff duty officer is authorized to release messages; but he must, as soon as possible, inform the commander, the chief of staff, and the cognizant division head of the emergency and the action taken.

The following procedure is carried out for the internal handling of incoming messages:

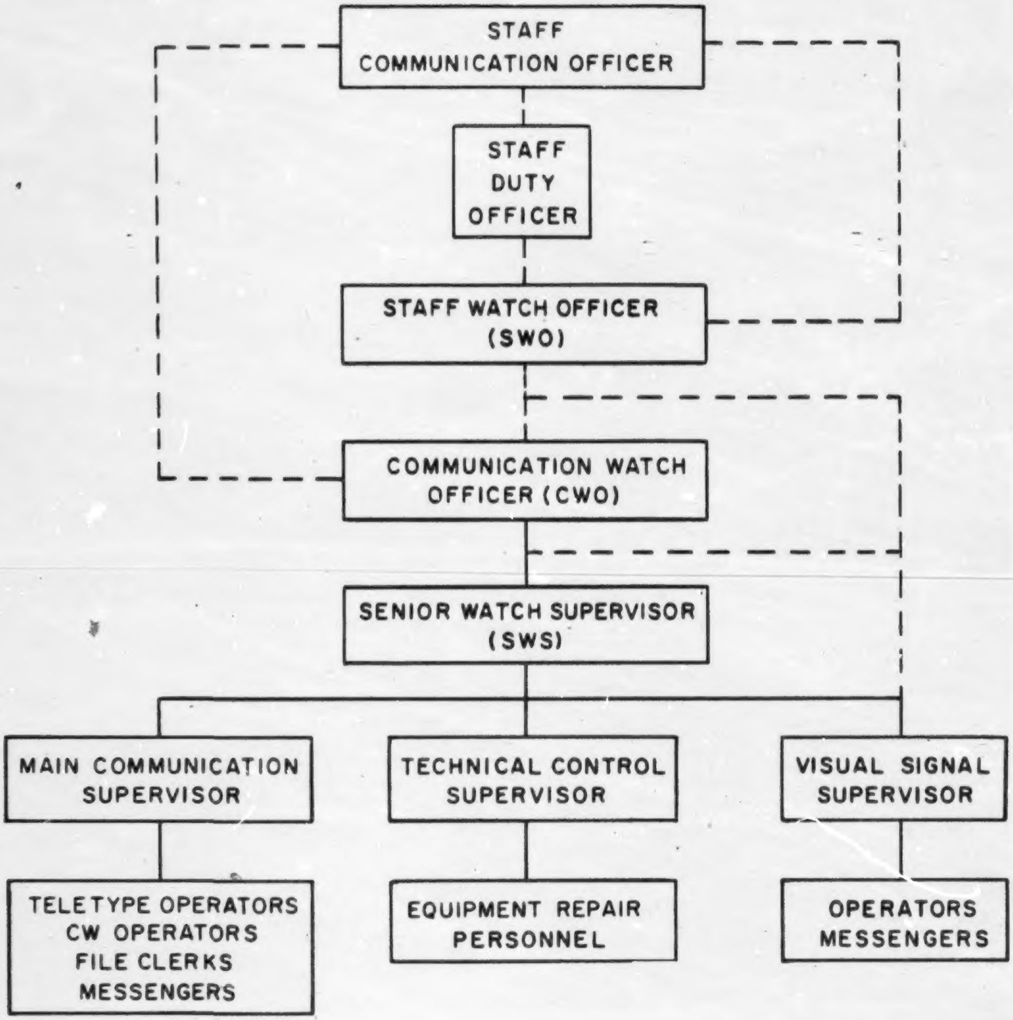
1. The CWO must designate an action officer for all messages addressed to the command.
2. On messages addressed to the command for action, the action copy must be delivered to the head of the division concerned, or his authorized representative, who must sign for the message and indicate time of receipt. Information copies must be delivered to other division heads who have interest in the purport of the message.
3. Messages delivered to the command for information must be delivered to the office of the cognizant division head.
4. Messages delivered to the command for action must also be delivered to the staff watch officer. He is then responsible for ensuring that the officer concerned takes action immediately or within a reasonable time. This stipulation is of particular importance during the night when action cannot be deferred until morning.
5. The staff communication officer is personally responsible for ensuring that all incoming messages are shown to the commander.
6. The staff communication officer must maintain a tickler file of all messages requiring action, and bring all conflicting, inconsistent, or overdue message communications to the attention of the officer(s) concerned.
7. Internal distribution and dissemination of Top Secret messages is limited to officers designated by the commander or the chief of staff. All such messages must first be shown to the chief of staff who will indicate routing. If the urgency of the message requires action in the absence of the chief of staff, the message must be delivered directly to the commander; or, in his absence, to the senior staff officer on board.

Regardless of its content or purport, a copy of each incoming or outgoing message must be shown to the chief of staff and the staff communication officer.

The communication division is divided into watch or duty sections like those of other divisions. Aboard ship, the duty sections are rotated in accordance with the communication watch setup of the ship, the staff communicators having been integrated with the flagship communicators. Ashore the number of duty sections and the watch rotation are determined by the staff communication officer who must take into consideration the number of personnel assigned and the amount of communication traffic expected to be handled. Typically, communicators ashore have watches in shifts, i.e., 0000-0800, 0800-1600, and 1600-2400, which are rotated every third day, thus providing an equitable distribution of watches and time off.

For efficient operation, a shipboard. staff communication center or a large shore-based staff requires a minimum of the following personnel:

1. A communication watch officer (CWO) who is in charge of each watch section and is responsible, under the overall guidance of the communication officer for–
   - Ensuring that communication capabilities of the command are exploited to the optimum in response to the mission and tasks of the command.
   - Maintaining, understanding, and ensuring compliance with all applicable rules, regulations, procedures, and current communication directives.
   - Monitoring the performance of the watch by inspecting spaces, spot-checking logs and monitor rolls, closely observing personnel at irregular intervals, sampling performance factors, such as internal message handling times and equipment and system activation or alignment times, and making periodic inquiries to users of remote controlled communication circuits.
   - Ensuring that off-line encryption is correct in all respects before authorizing its transmission.
   - Keeping apprised of circuit outages or difficulties, with reason therefor.
   - Keeping informed of the status of backlogs, high-precedence messages, and messages requiring special handling.
   - Staying abreast of the status of communication reports and taking appropriate action to ensure timely reporting for general evolutions.
   - Reporting directly to the communication officer on all routine matters and to staff officers on all matters of interest to them.
2. A senior watch supervisor (SWS), the senior enlisted person in each watch section. He is responsible to the CWO for all communications. In carrying out his duties he assists the CWO by–
   - Managing the overall operation of main communication, technical control, and the signal bridge.
   - Initiating action to restore or bypass equipment failures that cause circuit outage.
   - Directing action to prevent or overcome backlogs.
   - Monitoring the performance of the watch through an examination of logs and observation of equipment alignment and operation.
   - Notifying the CWO on all matters in his area of responsibility of an urgent or unusual nature, evidence of deviations from prescribed procedures, or other matters, as appropriate.
   - Such other duties as the CWO may assign.
3. A main communication supervisor who is responsible to the CWO/SWS for–
   - Supervising message processing and circuit operation functions.
   - Notifying the CWO or SWS of all matters in his area of responsibility of an urgent or unusual nature, evidence of deviation from prescribed procedures, or other matters, as appropriate.
4. A technical control supervisor. (As used here, technical control is the function of providing and maintaining communication circuits through circuit control and system alignment.) The technical control supervisor is responsible to the CWO/SWS for–
   - Supervising technical control functions.
   - Notifying the CWO or SWS of all matters in his area of responsibility of an unusual or urgent nature, evidence of deviation from prescribed procedures or other matters, as appropriate.
5. Aboard ship, a visual signal supervisor. Duties of the visual supervisor are described earlier in this chapter and in the Rate Training Manuals *SM 3&2* and *SM 1&C.*


STAFF COMMUNICATION OFFICER
STAFF DUTY OFFICER
STAFF WATCH OFFICER (SWO)
COMMUNICATION WATCH OFFICER (CWO)
SENIOR WATCH SUPERVISOR (SWS)
MAIN COMMUNICATION SUPERVISOR
TECHNICAL CONTROL SUPERVISOR
VISUAL SIGNAL SUPERVISOR
TELETYPE OPERATORS
CW OPERATORS
FILE CLERKS
MESSENGERS
EQUIPMENT REPAIR PERSONNEL
OPERATORS
MESSENGERS

37.35

Figure 11-2.–Staff communication watch organization.

In addition to the supervisory personnel, operators, messengers, and technicians are assigned to each watch section. All personnel in the watch section come under the supervision of the staff watch officer, and under the ultimate responsibility of the assistant chief of staff for communication. Figure 11-2 shows an organizational chart for a staff communication watch section.

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